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9 *Attorneys for Defendant Sonos, Inc.*

10 UNITED STATES DISTRICT COURT
11 NORTHERN DISTRICT OF CALIFORNIA

12 GOOGLE LLC,
13 Plaintiff,
14 v.
15 SONOS, INC.,
16 Defendant.
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Case No. 3:20-cv-6754

**DECLARATION OF ALYSSA CARIDIS
IN SUPPORT OF SONOS, INC.'S
MOTION TO DISMISS OR TRANSFER
TO THE WESTERN DISTRICT OF
TEXAS**

Date: November 17, 2020
Time: 9:30 a.m.
Location: Courtroom B, 15th Floor
Judge: Hon. Laurel Beeler
Complaint Filed: September 28, 2020
Trial Date: None Set

1 1. I am an attorney at the law firm of Orrick, Herrington & Sutcliffe LLP, counsel of
2 record for Defendant Sonos, Inc. (“Sonos”) in the above-captioned matter. I am a member in
3 good standing of the Bar of the State of California. I make this declaration based on my personal
4 knowledge, unless otherwise noted. If called, I can and will testify competently to the matter set
5 forth herein. I submit this declaration in support of Sonos, Inc.’s Motion to Dismiss or Transfer
6 to the Western District of Texas.

7 2. Attached hereto as **Exhibit A** is a true and correct copy of an email from Alaina
8 Kwasizur of Sonos to Bradley Riel and Tim Kowalski of Google, attaching a drafted complaint,
9 dated September 28, 2020.

10 3. Attached hereto as **Exhibit B** is a true and correct copy of an article by Michael
11 Allison, titled *Google Nest speakers are one step closer to replacing your Sonos system*,
12 published in Android Central, dated Aug. 18, 2020.

13 4. Attached hereto as **Exhibit C** is a true and correct copy of an article by Aaron
14 Brown, titled *Google Home upgrade brings some of the best Sonos features to your speakers*,
15 published in Express, dated Aug. 23, 2020.

16 5. Attached hereto as **Exhibit D** is a true and correct copy of an article by Olivia
17 Tambini, titled *New Google Nest release date, price, and rumors*, published in TechRadar, dated
18 Sept. 21, 2020.

19 6. Attached hereto as **Exhibit E** is a true and correct copy of a Google blog by Chris
20 Chan, titled *House music: New multi-room audio control from Nest*, (Aug. 18, 2020), available at
21 <https://blog.google/products/google-nest/new-multi-room-audio-control-nest/>.

22 7. Attached hereto as **Exhibit F** is a true and correct copy of Sonos’ Complaint for
23 Patent Infringement, filed in the Western District of Texas, in the *Sonos, Inc. v. Google LLC*, No.
24 6:20-cv-00881-ADA (W.D. Tex. Sept. 29, 2020) case.

25 8. Attached hereto as **Exhibit G** is a true and correct copy of Google Inc.’s
26 Opposition to Eolas Techs. Inc.’s Motion to Dismiss, filed in the Northern District of California,
27 in the *Google Inc. v. Eolas Techs. Inc.*, No. 3:15-cv-05446-JST (N.D. Cal. Mar. 4, 2016) case,
28 ECF No. 53-3.

1 9. Attached hereto as **Exhibit H** is a true and correct copy of Google's Motion to
2 Dismiss Under Federal Rule 12(B)(6) for Failure to State a Claim for Relief, filed in the Western
3 District of Texas, in the *Gabriel De La Vega, v. Google LLC*, No. 6:19-cv-00617-ADA (W.D.
4 Tex. Dec. 12, 2019) case, ECF No. 15.

5 10. Attached hereto as **Exhibit I** is a true and correct copy of Google LLC's Notice of
6 Motion and Motion to Dismiss Plaintiff's Amended Complaint for Failure to State a Claim
7 Pursuant to Fed. R. Civ. P. 12(B)(6), filed in the Northern District of California, in the
8 *Hypermedia Navigation LLC v. Google LLC*, No. 4:18-cv-06137-HSG (N.D. Cal. Jan. 4, 2019)
9 case, ECF No. 30.

10 11. Attached hereto as **Exhibit J** is a true and correct copy of the Google Careers Page
11 for Austin Texas, available at <https://careers.google.com/locations/austin/> (last visited Oct. 11,
12 2020).

13 12. Attached hereto as **Exhibit K** is a report from Docket Navigator of pending patent
14 cases in the Western District of Texas involving Google. The report shows 31 results. I have
15 reviewed these results, and if one removes duplication and Sonos' case filed against Google the
16 day after the present case was filed, these results indicate that Google is currently litigating 14
17 patent cases in the Western District of Texas.

18 13. Attached hereto as **Exhibit L** is a report from Docket Navigator of pending patent
19 cases in the Northern District of California involving Google. The report shows 20 results. I
20 have reviewed these results, and if one removes duplication and the present case, these results
21 indicate that Google is currently litigating 9 patent cases in this district.

22 14. Attached hereto as **Exhibit M** is true and correct copy of a Scheduling Order, filed
23 in the Western District of Texas, in the *Solas Oled Ltd., v. Dell Inc.*, No. 6:19-cv-631-ADA (W.D.
24 Tex. June 22, 2020) case, ECF No. 50.

25 15. Attached hereto as **Exhibit N** is true and correct copy of a Scheduling Order, filed
26 in the Western District of Texas, in the *Intellectual Tech LLC v. Zebra Techs. Corp.*, No. 6:19-cv-
27 628-ADA (W.D. Tex. Feb. 2, 2020) case, ECF No. 24.

28 16. Attached hereto as **Exhibit O** is true and correct copy of a Case Management

1 Order, filed in the Northern District of California, *USB Techs., LLC v. Sunvalleytek Int'l, Inc.*,
 2 No. 17-cv-3869 (N.D. Cal. Oct. 11, 2017) case, ECF No. 25.

3 17. Attached hereto as **Exhibit P** is true and correct copy of a Stipulation and
 4 Scheduling Order (as Modified by the Court), filed in the Northern District of California, in the
 5 *Amgen Inc. v. Sandoz Inc.*, No. 16-cv-2581 (N.D. Cal. Nov. 22, 2017) case, ECF No. 160.

6 18. Attached hereto as **Exhibit Q** is true and correct copy of Northern District of
 7 California's General Order No. 72, issued on March 16, 2020.

8 19. Attached hereto as **Exhibit R** is true and correct copy of Northern District of
 9 California's General Order No. 72-6, issued on September 16, 2020.

10 20. Attached hereto as **Exhibit S** is true and correct copy of Northern District of
 11 California's General Order No. 72-2, issued on April 30, 2020.

12 21. Attached hereto as **Exhibit T** is true and correct copy of Northern District of
 13 California's General Order No. 72-3, issued on May 21, 2020.

14 22. Attached hereto as **Exhibit U** is true and correct copy of Northern District of
 15 California's General Order No. 72-4, issued on June 24, 2020.

16 23. Attached hereto as **Exhibit V** is true and correct copy of Northern District of
 17 California's General Order No. 72-5, issued on July 23, 2020.

18 24. Attached hereto as **Exhibit W** is true and correct copy of Western District of
 19 Texas' Standing Order Regarding Coronavirus (COVID-19) and Court Proceedings, issued on
 20 Mar. 12, 2020.

21 25. Attached hereto as **Exhibit X** is true and correct copy of excerpts from ECF
 22 docket entries nos. 170, 271, 350 and the May 13, 2020 Minute Entry for *MV3 Partners LLC v.*
 23 *Roku, Inc.*, No. 18-cv-00308-ADA (W.D. Tex. 2020).

24 26. Attached hereto as **Exhibit Y** is true and correct copy of Western District of
 25 Texas' Waco Division Standing Order Regarding Trials in Waco, issued on August 18, 2020.

26 27. Attached hereto as **Exhibit Z** is a true and correct copy of an email from Paige
 27 Amstutz to Jeffrey Johnson, dated September 28, 2020.

28 I declare under penalty of perjury that the foregoing is true and correct to the best of my

1 knowledge. Executed this 12th day of October, 2020 in Los Angeles, California.
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ALYSSA CARIDIS

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Exhibit A

REDACTED

----- Forwarded message -----

From: **Alaina Kwasizur** [REDACTED]

Date: Mon, Sep 28, 2020 at 12:52 PM

Subject: Sonos Notice

To: Bradley Riel [REDACTED], Tim Kowalski [REDACTED]

Cc: <[REDACTED]>

Dear Tim and Brad,

As you know, Sonos spent years trying patiently and in good faith to resolve Google's infringement of Sonos's intellectual property. Despite Sonos's efforts, our discussions have never meaningfully progressed. Even since we filed in the ITC, Google has increased the scope of its infringement and brought a multiplicity of retaliatory lawsuits in countries around the world. These lawsuits will not have their intended effect.

Attached please find a courtesy copy of the complaint that we will file Tuesday, September 29th in the United States District Court. In this lawsuit, Sonos will focus on Google's infringement of U.S. Patents 9,967,615;

10,779,033; 9,344,206; 10,469,966; and 9,219,460 although, as we have discussed, Google infringes many more of Sonos's patents.

We continue to be hopeful that Google will reconsider its infringement and its refusal to engage in a meaningful discussion.

Best,

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Alaina Kwasizur

Sonos, Inc. | General Counsel, AMPAC | [REDACTED]

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Alaina Kwasizur

Sonos, Inc. | General Counsel, AMPAC & Chief Diversity & Inclusion Officer | [REDACTED]

**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION**

SONOS, INC.,

Plaintiff,

v.

GOOGLE LLC,

Defendant.

§ Case No.

§

§ **COMPLAINT FOR PATENT**
§ **INFRINGEMENT**

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§ **Jury Trial Demanded**

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COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Sonos, Inc. (“Sonos” or “Plaintiff”) hereby asserts claims for infringement of United States Patent Nos. 9,967,615; 10,779,033; 9,344,206; 10,469,966; and 9,219,460 (the “patents-in-suit”; attached hereto as Exhibits 1-5 respectively) against Defendant Google LLC (“Google” or “Defendant”), and alleges as follows:

INTRODUCTION

1. Sonos is an American success story. It was founded in 2002 in Santa Barbara, California by a handful of engineers and entrepreneurs with a vision to invent the world’s first wireless, whole-home audio system. At the time, popular audio systems were dependent on a centralized receiver hard-wired to each individual passive speaker throughout a home. Further, most homes with Internet access had dial-up connections, the iPhone was still five years away, and there were no streaming music services. The technological barriers confronting Sonos were enormous.

2. To deliver on its vision, the Sonos team completely reimagined the in-home music system as a decentralized network of smart playback devices, and it developed a platform that

could seamlessly and wirelessly distribute audio room by room or throughout the home at the user's discretion. Sonos created a "choose what to play, where to play it, and how loud" wireless audio system that could not only perform without lag (*e.g.* buffering, or network interruptions), but that was also so simple and intuitive that customers would make it part of their daily lives.

3. Commercial success did not come easy for Sonos as its vision was in many ways ahead of its time. But year by year, consumers – and the entire industry – came to appreciate that wireless multi-room audio devices and systems could not only work, but could become an essential part of the listening experience. Success required staying true to Sonos's disruptive vision, continuing to innovate while adjacent industries caught up and customers became more and more enamored with the idea of Sonos as they had the chance to encounter and use its products. Once Sonos had taken all the risks and placed enormous bets on research and development, the "first followers" began to copy Sonos's innovations.

4. To this day, Sonos remains focused on innovations that further enhance the listening experience. Sonos invests heavily in research and development and, as a result, frequently invents new systems with new technologies, enhanced functionality, improved sound quality, and an enriched user experience.

5. As a result, Sonos has become one of the world's leading providers of innovative audio products. In recognition of its wide-ranging innovations, the U.S. Patent & Trademark Office has granted or allowed Sonos more than 940 U.S. patents, including the patents-in-suit, with hundreds more patents in other countries. The innovations captured by these patents cover many important aspects of wireless multi-room audio devices/systems, including, for example, how to manage and control groups of playback devices, how to facilitate seamless control and transfer of audio playback among devices, and how to output amazing sound quality.

6. The industry has recognized the importance of Sonos's patents. For example, Sonos earned a spot on the IPO list of "Top 300 Organizations Granted U.S. Patents" and the

IEEE recognized Sonos as having one of “[t]he technology world’s most valuable patent portfolios.” *See* Exs. 6 and 7.

7. Sonos launched its first commercial products in 2005 and has since released a wide variety of critically acclaimed, patented, wireless multi-room audio products, including, for example, the Play:1, Play:3, Play:5 (Gen 1 and Gen 2), One (Gen 1 and Gen 2), One SL, Move, Playbar, Playbase, Beam, Sub, Connect, Port, Connect:Amp, Amp, Five, and Arc. *See, e.g.*, Ex. 8. Sonos’s products can be set up and controlled by the Sonos app. *Id.*

8. Sonos’s efforts have made it incredibly popular with its customers. Sonos estimates that in fiscal year 2019, Sonos’s customers listened to 7.7 billion hours of audio content using its products. And, as of September, 2019, almost two thirds of Sonos households had purchased and installed more than one Sonos product.

9. Sonos’s record of innovation has made it the undisputed leader in what has come to be called the “multiroom audio” field. *See, e.g.*, Ex. 9 (2018 Digital Trends: “Sonos is the king of multiroom audio....”); Ex. 10 (2019 What Hi-Fi: “[N]o multi-room offering is as complete or as pleasurable to live with as Sonos.”).

10. Sonos has already sued Google for infringing patents on its first group of inventions involving the set-up, control, playback, and synchronization of wireless playback devices. This case involves a second group of inventions which, as described more extensively below, tackle the novel technological challenges of how to stream music from a cloud-based service, how to create, manage, and invoke “zone scenes” to configure how multiple playback devices work together, and how to dynamically adjust the equalization of a playback device based on the environment in which the playback device is operating.

GOOGLE BEGINS INFRINGING

11. Almost a decade after Sonos created the smart-speaker market, Google entered the space. Initially, Google sought to work with Sonos and, through those efforts, gained access to

Sonos's engineers, products, and technology. All too quickly, however, Google shifted focus and began to develop and sell products that copied Sonos's technology and infringed Sonos's patents.

12. Part of what makes Sonos so successful is that, through its application, Sonos is compatible with many different third-party music streaming services. When Google publicly launched its own streaming music service – Google Play Music – in late 2011, Sonos worked with Google to integrate the Google Play Music service into the Sonos ecosystem. As a result, Google Play Music launched on the Sonos platform in 2014. *See, e.g.*, Ex. 11.

13. This should have benefited everyone: Sonos's customers gained access to another streaming service and Google Play Music users gained access to Sonos's devices. But as the press recognized at the time, Sonos's integration work with Google was especially “deep” and therefore gave Google a wide aperture through which to view Sonos's proprietary technology. *Id.* (2014 Wired: “This is the first time this sort of deep integration has happened between a third party music service and Sonos.”). The copying soon followed.

14. Just eighteen months later, in 2015, Google began willfully infringing Sonos's patents. On information and belief, Google used the knowledge it had gleaned from Sonos to build and launch its first wireless multi-room audio product – Chromecast Audio.

15. Google's Chromecast Audio began what has turned into Google's relentless effort to copy Sonos and use Sonos's patented technology. For example, although Google's original Chromecast Audio did not yet include Sonos's patented multi-room audio functionality, even when it was launched Google was working to add that Sonos-patented feature. *See* Ex. 12 (2015 The Guardian: “Google is also working on multi-room audio streaming using the Chromecast Audio, but it will not support the popular feature out of the box.”). And, when Google added the infringing feature, the press immediately noted how this “major feature update” made Google's product even more “like the ones made by Sonos:”

Google's recently-launched Chromecast Audio adapter is getting a major feature update this week: Consumers will now be able to group multiple Chromecast audio adapters to stream their favorite music simultaneously in more than one room,

similar to the multi-room support available for internet-connected loudspeakers like the ones made by Sonos.

Ex. 13 (2015 *Variety* article entitled “Google’s Chromecast Audio Adapter Gets Multi-Room Support Similar to Sonos”); *see also* Ex. 14 (2015 *Pocket-Lint*) (“You control your Sonos experience with one app. Well, thanks to a new software rollout, Chromecast Audio can pretty much do the same thing.”).

16. This has become a consistent pattern. Time and again, Google has added features to its products that first appeared in Sonos’s products and which make use of Sonos’s patented technology.

GOOGLE’S INFRINGEMENT ACCELERATES

17. Since 2015, Google’s misappropriation of Sonos’s patented technology has proliferated. Google has expanded its wireless multi-room audio system to more than a dozen infringing products, including the Google Home Mini, Google Home, Google Home Max, and Pixel phones, tablets, and laptops. And Google has persisted in infringing even though Sonos has warned Google of its infringement on at least four separate occasions dating back to 2016.

18. For example, in 2016 (a year after Google launched the Chromecast Audio wireless adapter), Google released the Google Home multi-room audio player (which was controlled by Google’s rebranded multi-room controller app – the Google Home app). Unlike the Chromecast Audio, the Google Home added an internal speaker driver making it an “all-in-one” audio player akin to Sonos’s prior Play:1, Play:3, and Play:5 products.

19. Sonos raised the issue of infringement as to these products with Google as early as August 2016. Sonos hoped that Google would respect Sonos’s intellectual property and the extensive work Sonos had put into inventing and developing its products. But Google did no such thing.

20. In October 2016, Sonos put Google on notice of infringement of 28 Sonos patents, including asserted United States Patent No. 9,344,206. Google, however, did not stop infringing.

Instead, it doubled down and introduced new infringing products, making use of *even more* patented technology from Sonos.

21. For example, in 2017, eight years after Sonos introduced its first all-in-one audio player – the Play:5 – Google released its first all-in-one audio players – the Google Home Max and the Google Home Mini. Google’s Home Max in particular was seen as a “Sonos Clone” and a “not-so-subtle copy of the [Sonos] Play:5 speaker....” Ex. 15. As explained by Gizmodo, “[i]t’s also hard not to see the [Google Home Max] device as something of a jab at Sonos.” *Id.*; *see also*, e.g., Ex. 16 (2017 Android Central: “You can’t help but look at Google Home Max... and come to the conclusion that Google is sticking its nose where Sonos has been for years.”).

22. Therefore, in January 2018, and then again in July 2018, Sonos put Google on notice that it was infringing even more Sonos patents, including asserted United States Patent No. 9,219,460. Then again, in February 2019, Sonos put Google on notice of infringement of 100 Sonos patents, including asserted United States Patent No. 9,967,615.

23. Nothing Sonos did, however, deterred Google from expanding its infringement. Google’s infringing product line now includes at least the Chromecast, Chromecast Ultra, Chromecast Audio, Chromecast with Google TV, Home Mini, Nest Mini, Home, Home Max, Home Hub, Nest Hub, Nest Hub Max, Nest Audio, and Nest Wifi Point (individually or collectively, “Google Audio Player(s)”), all of which can be controlled by, for example, the YouTube Music app, the Google Play Music app, the YouTube app, and the Google Home app (individually or collectively, “Google App(s)”). *See, e.g.*, Exs. 17-27.

24. In addition to providing the Google Apps for controlling the Google Audio Players, Google also offers various infringing hardware controllers that are pre-installed with the Google Play Music app, YouTube app, and/or YouTube Music app (and capable of downloading and executing the Google Apps that are not pre-installed). These infringing hardware controllers include, for example, Google’s “Pixel” phones, tablets, and laptops (e.g., the Pixel 3, Pixel 3 XL, Pixel 3a, Pixel 3a XL, Pixel 4, Pixel 4 XL, and Pixel 4a phones, the Pixel Slate tablet, and the

Pixelbook and Pixelbook Go laptops) (individually or collectively, “Google Pixel Device(s)”).
See, e.g., Exs. 28-32.

25. Herein, “Google Wireless Audio System” refers to one or more Google Audio Players, one or more Google Pixel Devices, and/or one or more Google Apps.

26. In order to hold Google accountable for its willful infringement of Sonos’s patents, Sonos filed a complaint in January 2020 asking the United States International Trade Commission (“ITC”) to institute an investigation into Google’s unlawful importation into and sale in the United States of infringing products. The ITC instituted an investigation, *In re Certain Audio Players and Controllers, Components Thereof, and Products Containing Same*, Inv. No. 337-TA-1191 to determine whether Google’s audio players and controllers infringe five Sonos patents directed to fundamental features such as playing music on multiple speakers in synchrony, playing music in stereo over two or more players, a controller that can easily setup a player on a wireless network, and playback-control features such as controlling both the volume of individual speakers and a group of speakers.

27. While the ITC Investigation has been pending, Google has continued to increase its infringement. For example, press reports indicate that Google is introducing new products and changes that mean Google is “one step closer to replacing your Sonos system.” Ex. 33; *see also* Ex. 44 (“The new functionality appears to be the most direct challenge to the likes of Sonos, which has enjoyed enormous success by creating a series of connected speakers and soundbars that can play music simultaneously – or individually.”). The press has similarly noted that Google’s new speaker “could be a new rival for the likes of the Sonos One, the best smart speaker you can buy in 2020.” Ex. 34; *see also* Ex. 44 (“Just like Sonos, you can also change the volume on each speaker individually from the main interface.”). And press reports indicate that Google has expanded its use of Sonos’s stereo pair technology into the new smart-speakers even though Google is *currently* being sued for infringing a Sonos patent on this technology. Exs. 35, 44.

28. Google itself has also highlighted the importance of its use of Sonos’s technology. For example, Google’s Chris Chan publicly stated that “[c]ontrolling the audio throughout my

home, no matter who's listening, has been incredibly helpful" and that "[t]oday, we're expanding that control. You can already manually group Nest devices in order to play the same music on various speakers at the same time, and now we're launching multi-room control so you can dynamically group multiple cast-enabled Nest devices (speakers, Smart Displays, Chromecasts) in real-time to fill multiple rooms with music." Ex. 35; *see also* Ex. 44. Again, Google has expanded its use of this technology *while* it is being sued for infringing Sonos's patents on this precise technology.

29. Google's aggressive and deliberate expansion of its use of Sonos's patented technology has led observers to conclude that "[n]o market is safe from [the] search engine monster" and that Google was specifically "offering new products to compete with Sonos in the music streaming market." *See* Ex. 36.

GOOGLE'S CONTINUED INFRINGEMENT FORCES THIS SUIT

30. In the face of Google's unrelenting infringement, Sonos has no choice but to bring this suit. In this action, Sonos asserts patents that are not at issue in the ITC or the related district court action. Sonos is also accusing Google's Wireless Audio System of infringing different patented features than are at issue in either of those actions.

31. Sonos's ITC suit addressed Google's infringement of Sonos patents covering fundamental aspects of wireless, whole-home audio systems. While groundbreaking, those patents represent only some of Sonos's ongoing innovation from its inception to today. Through its foresight, substantial investment, and relentless pursuit of excellence, Sonos built on its previous success and invented a number of key features consumer have grown to expect and demand in streaming music listening.

32. For example, as explained more fully below, Sonos's U.S. Patent Nos. 9,967,615 and 10,779,033 (the "'615 Patent" and the "'033 Patent," respectively) cover key aspects of Sonos's inventive approach for streaming music from a cloud-based service to a media playback system, including technology for transferring playback responsibility for a cloud-based stream of

media content from a user's device, such as a smart phone, to a media playback system that is then configured to retrieve and play back the cloud-based media content.

33. Sonos was well ahead of the field when it began to develop these inventions in 2011. At that time, Sonos's audio system, including its smart-phone app controller, was in a category all its own. Moreover, streaming content from cloud-based media services for playback by computers – let alone other types of networked devices like smart phones and smart speakers – was in its infancy. Nonetheless, at a time years before Google released its first Chromecast product, Sonos envisioned a novel experience of continuous and intuitive control of a user's entire streaming listening experience, across multiple networked devices, including smart phones and/or smart speakers. That vision gave rise to the innovation of technology for enabling seamless transition of playback responsibility for cloud-based media content between different networked devices, such as a smart phone and a smart speaker. This paradigm is now fundamental across the entire streaming industry as user expectations of continuous listening experiences have continued to converge with Sonos's vision.

34. Similarly, Sonos's U.S. Patent Nos. 9,344,206 and 10,469,966 (the "'206 Patent" and the "'966 Patent," respectively) cover some of Sonos's inventions related to creating, managing, and invoking "zone scenes" to configure how multiple players work together. With these patents, Sonos once again anticipated what consumers would want and invented a new feature for its system. Using the inventions of the '206 and '966 Patents, playback devices can be grouped together for synchronous playback in an easy and intuitive manner using "zone scenes." Advantageously, such a "zone scene" can be accessed and invoked by multiple devices and in various ways (*e.g.*, by voice) even when the particular controller that created the "zone scene" is not on the network.

35. In addition, Sonos's U.S. Patent No. 9,219,460 (the "'460 Patent") covers a Sonos invention related to dynamically adjusting the equalization of a playback device based on its environment. Naturally, consumers want their speakers to sound great, regardless of the environment in which the playback device is operating, but changes in the playback device's

listening environment could impact sound quality. For example, a playback device may be configured to perform advantageously in a small room, but nonetheless may come to be positioned outdoors. When operating outdoors, boosting the bass levels of the playback may result in an improved listening experience for some consumers. However, previous technology for setting the equalization parameters for a playback device made it very difficult to optimize the playback device's equalization parameters for its listening environment. The '460 Patent provides technology that enables a playback device to adjust its own equalization settings based on one or more reflection characteristics of an audio signal in order to optimally match the playback device's listening environment.

36. Sonos provided a pre-filing copy of this Complaint to Google, thereby providing clear pre-suit notice of infringement of the patents-in-suit. Google, however, has never given any indication that it is willing to stop infringing, and did not do so in response to receiving a draft of this complaint.

37. On information and belief, Google is unwilling to stop infringing because its infringement of Sonos's patented inventions has paved the way for Google to generate billions of dollars in revenue. A December 2018 market report by Royal Bank of Canada ("RBC"), for example, concluded that Google sold over 40 million Google Home devices in the U.S. and that Google generated \$3.4 billion in Google Home revenue in 2018 alone. Ex. 37 at pp. 1, 4, 14-15. RBC also found that, as of August 2017, Google had sold more than 55 million Chromecast devices and that Google generated almost \$1 billion in Chromecast revenue in 2018. *Id.* at pp. 4, 16, 18. Further, RBC estimated that, in 2018, Google generated \$3.4 billion in Pixel device revenue. *Id.* at pp. 4, 8.

38. By 2021, RBC estimates that Google will be annually selling over 100 million Google Home devices in the U.S. and generating over \$8 billion in Google Home revenue. *Id.* at pp. 4, 14-15. In addition, by 2021, RBC estimates that Google will annually generate \$2.4 billion in Chromecast revenue and nearly \$7 billion in Pixel device revenue. *Id.* at pp. 4, 8, 18.

39. The revenue obtained from the sale of Google’s hardware devices vastly understates the value to Google of infringing Sonos’s patents. On information and belief, Google is intentionally selling the infringing products at a discount and/or as a “loss leader” with the expectation that this will allow Google to generate even more revenue in the future – e.g., by powering Google’s continued dominance of the market for search advertising. In particular, Google’s infringement of Sonos’s patented inventions has helped and/or will help Google generate significant revenue from the use of Google’s hardware devices including advertising, data collection, and search via the Google Wireless Audio Systems. As the *New York Post* explained, “Amazon and Google both discounted their home speakers so deeply over the holidays that they likely lost a few dollars per unit ... hoping to lock in customers and profit from later sales of goods and data about buying habits.” Ex. 38. Similarly, *News Without Borders* explained that companies like Google are using their “smart speaker” devices as “‘loss leader[s]’ to support advertising or e-commerce.” Ex. 39.

40. On information and belief, Google’s copying of Sonos’s patented inventions has also helped and/or will help Google generate significant revenue from driving its users to make purchases such as streaming music subscriptions and retail purchases via the Google Wireless Audio Systems. For example, an NPR “smart speaker” survey found that 28% of survey respondents agreed that “[g]etting [a] Smart Speaker led [them] to pay for a music service subscription,” and Google offers two such subscriptions – Google Play Music and YouTube Music. Ex. 40 at p. 20. Likewise, the NPR survey also found that 26% of respondents use their smart speakers “regularly” to “add [items] to shopping list.” *Id.* at p. 14; *see also, e.g.*, Ex. 39 (stating that companies like Google are using their “smart speaker” devices as “‘loss leader[s]’ to support... e-commerce.”).

41. On information and belief, Google is willfully infringing Sonos’s patents as part of Google’s calculated strategy to vacuum up invaluable consumer data from users and, thus, further entrench the Google platform among its users and fuel its dominant advertising and search platforms.

42. Google’s infringement – and its strategy to sell its infringing products at a loss to develop alternative revenue streams – has caused significant damage to Sonos. For example, the Google Home Mini predatorily implemented Sonos’s valuable patented technology into an all-in-one wireless multi-room product that Google sells at a highly subsidized price point or even gives away for free. Ex. 41 (“At \$49, Google Home Mini works on its own or you can have a few around the house, giving you the power of Google anywhere in your home.”); Ex. 39 (“Google partnered with Spotify to offer Home Minis as a free promotion for Spotify Premium customers. Spotify’s premium userbase is nearly 90 million, so if even a fraction of users take the free offer, a massive influx of Google smart speakers will enter the market.”).

THE PARTIES

43. Plaintiff Sonos, Inc. is a Delaware corporation with its principal place of business at 614 Chapala Street, Santa Barbara, California 93101. Sonos is the owner of the patents-in-suit. Sonos holds all substantial rights, title and interest in and to the Asserted Patents.

44. Defendant Google LLC is a Delaware limited liability corporation with its principal place of business at 1600 Amphitheatre Parkway, Mountain View, CA 94043. Google maintains a physical address in this district at 500 West 2nd Street, Austin, Texas, 78701. Google may be served with process through its registered agent, the Corporation Service Company, at 211 East 7th Street, Suite 620, Austin Texas 78701. Google is registered to do business in the State of Texas and has been since at least November 17, 2006.

45. Google LLC is one of the largest technology companies in the world and conducts product development, engineering, sales, and online retail, search, and advertising operations in this District.

46. Google LLC directly and/or indirectly develops, designs, manufactures, distributes, markets, offers to sell, sells, and/or imports the infringing Google Wireless Audio System at issue in this litigation in/into the United States, including in the Western District of Texas, and otherwise purposefully directs infringing activities to this District in connection with its Google Wireless Audio System.

JURISDICTION AND VENUE

47. This action for patent infringement arises under the Patent Laws of the United States, 35 U.S.C. § 1 et. seq. This Court has original jurisdiction under 28 U.S.C. §§ 1331 and 1338.

48. This Court has personal jurisdiction over Google because, pursuant to Fed. R. Civ. P. 11(b)(3), Google has: (1) availed itself of the rights and benefits of the laws of the State of Texas, (2) transacted, conducted, and/or solicited business and engaged in a persistent course of conduct in the State of Texas (and in this District), (3) derived substantial revenue from the sales and/or use of products, such as the infringing Google Wireless Audio System, in the State of Texas (and in this District), (4) purposefully directed activities (directly and/or through intermediaries), such as shipping, distributing, offering for sale, selling, and/or advertising its infringing Google Wireless Audio System, at residents of the State of Texas (and residents in this District), (5) delivered its infringing Google Wireless Audio System into the stream of commerce with the expectation that the Google Wireless Audio System will be used and/or purchased by consumers, and (6) committed acts of patent infringement in the State of Texas (and in this District).

49. This Court also has personal jurisdiction over Google because it is registered to do business in the State of Texas and has one or more regular and established places of business in the Western District of Texas.

50. Venue is proper in this District under the provisions of 28 U.S.C. § 1400(b) because, as noted above, Google has committed acts of infringement in this district and has one or more regular and established places of business in this district. Google has also repeatedly admitted that venue is proper in this District for various patent cases. *See e.g., Solas OLED Ltd. v. Google, Inc.* (WDTX Case No. 6-19-cv-00515) and *VideoShare, LLC v. Google LLC et al* (WDTX Case No. 6-19-cv-00663).

THE PATENTS-IN-SUIT

U.S. Patent No. 9,967,615

51. Sonos is the owner of U.S. Patent No. 9,967,615 (the “’615 Patent”), entitled “Networked Music Playback,” which was duly and legally issued by the United States Patent and Trademark Office (“USPTO”) on May 8, 2018. A copy of the ’615 Patent, is attached hereto as Exhibit 1.

52. The ’615 Patent relates generally to technology for facilitating transfer of playback responsibility from a user’s device to a media playback system.

53. The ’615 Patent recognized that “[t]echnological advancements have increased the accessibility of music content, as well as other types of media....” ’615 Patent at 1:19-20. This allowed users to access audio and video content over the Internet. *Id.* at 1:21-26.

54. But, the ’615 Patent identified a particular problem and provided an unconventional technological solution. Specifically, the patent recognized that “[w]ired or wireless networks can be used to connect one or more multimedia playback devices for a home or other location playback network (*e.g.*, a home music system).” ’615 Patent at 1:66-2:2. This means that “[m]usic and/or other multimedia content can be shared among devices and/or groups of devices (also referred to herein as zones) associated with a playback network.” *Id.* at 2:6-9. The ’615 Patent is directed to a method, tangible media, and controller that “facilitate streaming or otherwise providing music from a music-playing application (*e.g.*, browser-based application, native music player, other multimedia application, and so on) to a multimedia content playback (*e.g.*, SonosTM) system.” *Id.* at 2:10-14.

55. The ’615 Patent provides an unconventional technological solution to this problem. For example, the ’615 Patent describes an “Example Controller” that “can be used to facilitate the control of multi-media applications....” ’615 Patent at 9:8-14. “In particular, the controller 500 is configured to facilitate a selection of a plurality of audio sources available on the network and enable control of one or more zone players ... through a wireless network interface 508.” *Id.* at 9:14-18. Further, the ’615 Patent describes embodiments that “enable a user to stream

music from a music-playing application (*e.g.*, browser-based application, native music player, other multimedia application and so on) to a local multimedia content playback (*e.g.*, Sonos™) system.” ’615 Patent at 12:8-12. More specifically, the ’615 Patent teaches that while “a user listens to a third party music application (*e.g.*, Pandora™ Rhapsody™, Spotify™, and so on)” on a user device, such as the user’s “smart phone,” the user can “select[] an option to continue playing [the current] channel on her household music playback system (*e.g.*, Sonos™),” which will cause the user’s “playback system” to “pick[] up from the same spot on the selected channel that was on her phone and output[] that content (*e.g.*, that song) on speakers and/or other playback devices connected to the household playback system.” *Id.* at 12:44-53; *see also id.* at 13:1-53.

56. The ’615 Patent goes on to teach specific technology for facilitating this transfer of playback responsibility from the user’s device to the user’s playback system. For instance, the ’615 Patent teaches that one aspect of this technology involves causing data for retrieving network-based media content (such as a uniform resource locator (URI)) to be passed to a playback device in the playback system so that the playback device can “run on its own to fetch the content” from a networked audio source, such as a “cloud” server that is accessible over the Internet. *Id.* at 12:53-63; *see also id.* at 12:63-67 (describing that “[a] third party application can open or utilize an application programming interface (API) to pass music to the household playback system without tight coupling to that household playback system”); 15:47-16:19 (describing a “throw it over the wall” approach in which “a third party application provides a multimedia playback device (*e.g.*, a Sonos™ zone player (ZP)) with enough information about content (*e.g.*, an audio track) so that . . . the local playback system (*e.g.*, SonosNet™) can directly access a source of the content and . . . play the content directly off the network (*e.g.*, the Internet) or cloud,” where the “connection between the third-party application and the local playback device (*e.g.*, Sonos ZonePlayer™) can be direct over a local area network (LAN)” or “remote through a proxy server in the cloud”); 16:53-17:4 (describing various embodiments for “queue management” associated with the transfer of playback from a control device to a playback system, including an embodiment where a “shared queue is provided between the local playback system

and the third party application to keep the local system and the application synchronized”). Further, the ’615 Patent teaches that another aspect of this technology involves transitioning the user’s device into a mode in which it functions to control the playback of the media content by the user’s playback system after the transfer. *Id.* at 16:20-42, 17:5-20. In this way, the technology taught by the ’615 Patent provides for intuitive and seamless transfer of playback responsibility from a user’s device to a media playback system.

57. In line with these teachings, the ’615 Patent claims devices, computer-readable media, and methods for facilitating transfer of playback responsibility from a user’s device to a media playback system.

58. For example, claim 13 of the ’615 Patent recites a non-transitory computer readable storage medium including instructions for execution by a processor that, when executed, cause a control device to perform various functions that facilitate transfer of playback responsibility from the device to a media playback system. *See* ’615 Patent, claim 13. When the instructions are executed, the control device is initially operable to (i) cause a graphical interface to display a control interface including one or more transport controls to control playback by the control device, (ii) identify playback devices connected to a local area network, (iii) cause the graphical interface to display a selectable option for transferring playback from the control device, and (iv) detect a set of inputs to transfer playback from the control device to a particular playback device. *Id.* Additionally, the instructions configure the control device so that, after detecting the set of inputs to transfer playback from the control device to the particular playback device, the control device is operable to cause playback to be transferred from the control device to the particular playback device by (a) causing one or more first cloud servers to add multimedia content to a local playback queue on the particular playback device, wherein adding the multimedia content to the local playback queue comprises the one or more first cloud servers adding, to the local playback queue, one or more resource locators corresponding to respective locations of the multimedia content at one or more second cloud servers of a streaming content service, (b) causing playback at the control device to be stopped, and (c) modifying the one or

more transport controls of the control interface to control playback by the playback device. *Id.* Additionally yet, the instructions configure the control device so that the control device is operable to cause the particular playback device to play back the multimedia content, which involves the particular playback device retrieving the multimedia content from one or more second cloud servers of a streaming content service and playing back the retrieved multimedia content. *Id.*

U.S. Patent No. 10,779,033

59. Sonos is the owner of U.S. Patent No. 10,779,033 (the “’033 Patent”), entitled “Systems And Methods For Networked Music Playback,” which was duly and legally issued by the United States Patent and Trademark Office (“USPTO”) on September 15, 2020. A copy of the ’966 Patent, is attached hereto as Exhibit 2.

60. The ’033 Patent is related to the ’615 Patent in that they are both continuations of application No. 13/341,237, filed on December 30, 2011, now U.S. Patent No. 9,654,821. Thus, the ’033 and ’615 Patents share essentially the same specification. Sonos incorporates by reference and re-alleges paragraphs 52-58 of this Complaint as if fully set forth herein.

61. Like the ’615 Patent, the ’033 Patent claims devices, computer-readable media, and methods for facilitating transfer of playback responsibility from a user’s device to a media playback system, which provide an unconventional solution to the technological problem described in the ’615 Patent.

62. For example, claim 1 of the ’033 Patent recites a computing device with specific hardware configurations, including a non-transitory computer-readable medium that stores program instruction that can be executed by the device’s processor(s). *See* ’033 Patent, claim 1. When the instructions are executed, the computing device can initially operate in a first mode in which it is configured for playback of a remote playback queue provided by a cloud-based computing system associated with a cloud-based media service. *Id.* In that mode, the computing device is operable to (i) display a representation of one or more playback devices in a media playback system that are communicatively coupled to the computing device over a data network and available to accept playback responsibility for the remote playback queue, and (ii) while

displaying the representation of the one or more playback devices, receive user input indicating a selection of at least one given playback device from the one or more playback devices. *Id.* Additionally, the instructions configure the computing device so that, based on receiving the user input, the computing device is operable to transmit an instruction for the at least one given playback device to take over responsibility for playback of the remote playback queue from the computing device, wherein the instruction configures the at least one given playback device to (i) communicate with the cloud-based computing system in order to obtain data identifying a next one or more media items that are in the remote playback queue, (ii) use the obtained data to retrieve at least one media item in the remote playback queue from the cloud-based media service; and (iii) play back the retrieved at least one media item. *Id.* Additionally yet, the instructions configure the computing device so that the computing device is operable to detect an indication that playback responsibility for the remote playback queue has been successfully transferred from the computing device to the at least one given playback device, and then after detecting the indication, transition from (a) the first mode in which the computing device is configured for playback of the remote playback queue to (b) a second mode in which the computing device is configured to control the at least one given playback device's playback of the remote playback queue and the computing device is no longer configured for playback of the remote playback queue. *Id.*

U.S. Patent No. 9,344,206

63. Sonos is the owner of U.S. Patent No. 9,344,206 (the "'206 Patent"), entitled "Method And Apparatus For Updating Zone Configurations In A Multi-Zone System," which was duly and legally issued by the United States Patent and Trademark Office ("USPTO") on May 17, 2016. A copy of the '206 Patent, is attached hereto as Exhibit 3.

64. The '206 Patent relates generally to consumer electronics and human-computer interaction and, more specifically, to controlling or manipulating a plurality of multimedia players in a multi-zone system. *See, e.g.,* '206 Patent at 1:25-29.

65. The '206 Patent recognized that users demand not only quality audio reproduction but also a system that allows multiple players to access music from different sources. '206 Patent at 1:30-40. Before the '206 Patent, a conventional multi-zone audio system might include a number of audio sources, but each audio source had to be connected to its own amplifier and a set of speakers and was typically installed in one place. *Id.* at 1:40-44. This had inherent limitations. "In order to play an audio source at one location, the audio source must be provided locally or from a centralized location. When the audio source is provided locally, the multi-zone audio system functions as a collection of many stereo systems, making source sharing difficult. When the audio source is provided centrally, the centralized location may include a juke box, many compact discs, an AM or FM radio, tapes, or others. To send an audio source to an audio player demanding such source, a cross-bar type of device is used to prevent the audio source from going to other audio players that may be playing other audio sources." *Id.* at 1:44-44.

66. Moreover, as the '206 Patent recognized, "[i]n order to achieve playing different audio sources in different audio players, the traditional multi-zone audio system is generally either hard-wired or controlled by a pre-configured and pre-programmed controller." '206 Patent at 1:56-59. Such a system created problems. "While the pre-programmed configuration may be satisfactory in one situation, it may not be suitable for another situation. For example, a person would like to listen to broadcast news from his/her favorite radio station in a bedroom, a bathroom and a den while preparing to go to work in the morning. The same person may wish to listen in the den and the living room to music from a compact disc in the evening. In order to satisfy such requirements, two groups of audio players must be established. In the morning, the audio players in the bedroom, the bathroom and the den need to be grouped for the broadcast news. In the evening, the audio players in the den and the living room are grouped for the music. Over the weekend, the audio players in the den, the living room, and a kitchen are grouped for party music. Because the morning group, the evening group and the weekend group contain the den, it can be difficult for the traditional system to accommodate the requirement of dynamically managing the ad hoc creation and deletion of groups." *Id.* at 1:59-2:10.

67. Thus, the '206 Patent recognized “a need for dynamic control of the audio players as a group” and a system in which “the audio players may be readily grouped.” '206 Patent at 2:11-13. The invention of the '206 Patent would, thus, overcome the problems “in a traditional multi-zone audio system [where] the audio players have to be adjusted one at a time, resulting in an inconvenient and non-homogenous audio environment.” *Id.* at 2:13-16.

68. The '206 Patent provided an unconventional solution to this technological problem. “In general, the present invention pertains to controlling a plurality of multimedia players, or simply players, in groups.” '206 Patent at 2:28-29. One specific aspect of the grouping technology that is taught by the '206 Patent involves a controller with a user interface that permits a user to configure and save a “zone scene,” which may comprise a “predefined” grouping of zone players that can later be “activated” (or “invoked”) in order to group the zone players in the “zone scene” together for synchronous playback. *Id.* at 2:30-53, 2:60-3:4, 8:19-10:45. The '206 Patent explains that this “zone scene” technology for grouping zone players together for synchronous playback provides improvements over the existing technology for grouping zone players together for synchronous playback, which involved defining the group membership at the time that the group was to be invoked – particularly in situations where a larger number of zone players are to be grouped together for synchronous playback. *Id.* at 8:19-55. For instance, the benefits highlighted by the '206 Patent include (i) allowing a group of zone players to be “predefined” as part of a “zone scene” so that the group’s membership need not be defined at the time that the group is to be invoked, (ii) allowing a predefined group to be invoked without requiring the zone players in the group to be separated from other groups beforehand, and (iii) allowing zone players to exist as part of multiple different predefined groups that can be invoked in order to dynamically group the zone players for synchronous playback. *Id.* at 8:19-10:45.

69. In line with these teachings, the '206 Patent claims devices, computer-readable media, and methods for managing and using “zone scenes” to facilitate grouping of zone players. For example, claim 1 of the '206 Patent recites a “multimedia controller including a processor” that is configured to (i) receive, via a network interface, a zone configuration from a first

independent playback device of a plurality of independent playback devices, wherein the zone configuration is configured via the controller and maintained at the first independent playback device, and wherein the zone configuration characterizes one or more zone scenes, each zone scene identifying a group configuration associated with two or more of the plurality of independent playback devices, and (ii) cause a selectable indication of the received zone configuration to be displayed, wherein the displayed selectable indication is selectable to cause one or more of the zone scenes to be invoked by two or more of the plurality of independent playback devices. *See* '206 Patent, claim 1.

U.S. Patent No. 10,469,966

70. Sonos is the owner of U.S. Patent No. 10,469,966 (the “’966 Patent”), entitled “Zone Scene Management,” which was duly and legally issued by the United States Patent and Trademark Office (“USPTO”) on November 5, 2019. A copy of the ’966 Patent, is attached hereto as Exhibit 4.

71. The ’966 Patent is related to the ’206 Patent in that they are both continuations of application No. 13/896,829, filed on May 17, 2013, now U.S. Patent No. 8,843,228. Thus, the ’966 and ’206 Patents share essentially the same specification. Sonos incorporates by reference and re-alleges paragraphs 64-69 of this Complaint as if fully set forth herein.

72. The ’906 Patent claims devices, computer-readable media, and methods for managing and using “zone scenes” to facilitate grouping of zone players, which provides an unconventional solution to the technological problems related to grouping zone players that are described in the ’906 Patent.

73. For example, claim 1 of the ’966 Patent describes a computing device with a processor that can execute instructions stored in the controllers non-transitory, computer-readable medium. Those instructions, when executed, cause the computing device to be operable to (i) receive a first request to create a first zone scene comprising a first predetermined grouping of zone players that are to be configured for synchronous playback when the first zone scene is invoked, and (ii) based on the first request, cause creation of the first zone scene, cause an

indication of the first zone scene to be transmitted to a first zone player in the first zone scene, and cause storage of the first zone scene. *See, e.g.*, '966 Patent, claim 1. Additionally, the instructions, when executed, cause the computing device to be operable to (i) receive a second request to create a second zone scene comprising the first zone player and at least one other zone player that is not in the first zone scene, and (ii) based on the second request, cause creation of the second zone scene, cause an indication of the second zone scene to be transmitted to the first zone player, and cause storage of the second zone scene. *Id.* Additionally yet, the instructions, when executed, cause the computing device to be operable to (i) display representations of the first and second zone scenes, (ii) while displaying the representations, receive a third request to invoke the first zone scene, and (iii) based on the third request, cause the first zone player to transition from operating in a standalone mode to operating in accordance with the first predefined grouping of zone players so that the first zone player is configured to coordinate with at least the second zone player to output media in synchrony with output of media by at least the second zone player. *Id.*

U.S. Patent No. 9,219,460

74. Sonos is the owner of U.S. Patent No. 9,219,460 (the "'460 Patent"), entitled "Audio Settings Based on Environment," which was duly and legally issued by the United States Patent and Trademark Office ("USPTO") on December 22, 2015. A copy of the '460 Patent, is attached hereto as Exhibit 5.

75. The '460 Patent relates generally to "consumer goods and, more particularly, to methods, systems, products, features, services, and other elements directed to media playback or some aspect thereof." '460 Patent at 1:6-9. More specifically, the '460 Patent is directed to dynamically adjusting the equalization of a playback device based on the environment in which the playback device is operating. *See, e.g., id.* at 1:64-66.

76. The '460 Patent recognized that "[w]hile a playback device may be factory configured to perform advantageously in a typical operating environment, the factory configuration may not be ideal for all environments." '460 Patent at 1:66-2:2. According to the

'460 Patent, "adjusting the equalization of the playback device based on the current operating environment may improve the listening experience for some listeners." *Id.* at 2:3-5.

77. The '460 Patent recognized that there are several problems with existing technology for adjusting an audio player's equalization. '460 Patent at 2:12-14. For instance:

First, the adjustment process is often overlooked by the user because, for example, the user may be required to initiate the adjustment and position the microphone. Second, the adjustment process requires a separate microphone, which may not be included with any of the components of the audio system. Third, the manual approach does not lend itself to frequent adjustment when one or more of the speakers may be re-positioned in different locations throughout a home or outdoors.

Id. at 2:23-32.

78. The '460 Patent provides an unconventional technological solution to these problems. For example, the '460 Patent discloses a playback device that "emit[s] an audio signal, such as a pulse, . . . [which] may encounter various objects, such as walls and furniture, throughout the environment." '460 Patent at 2:37-42. The '460 Patent further discloses that "[w]hen an object is encountered, the object may variably reflect or absorb portions of the audio signal," and "[a]t some point, a portion of the reflected audio signal may reflect back toward the playback device from which the audio signal was emitted." *Id.* at 2:42-50. According to the '460 Patent, "[t]he microphone of the playback device may then detect at least a portion of the reflected audio signal," and "[i]n response to detecting the reflected audio signal, the playback device may determine one or more reflection characteristics based on the reflected audio signal." *Id.* at 2:50-55. Moreover, the '460 Patent discloses that "[t]he playback device may then adjust an equalization setting of the playback device based on the one or more reflection characteristics," and "[o]nce the equalization setting is adjusted, the playback device may then play an audio track according to the equalization setting." *Id.* at 3:6-26.

79. In line with these teachings, the '460 Patent claims devices, systems, and methods for dynamically adjusting the equalization of a playback device based on the environment in which the playback device is operating, which provide an unconventional solution to the technological problems described in the '460 Patent. For example, claim 15 of the '460 Patent

describes a playback device with a speaker, a microphone that is physically coupled to the speaker, a processor, a network interface, a data storage, and a program logic stored in the data storage and executable by the processor. The program logic, when executed, causes the playback device to be operable to (i) emit a first audio signal from the speaker, and (ii) detect a second audio signal via the microphone that is physically coupled to the speaker, where at least a portion of the second audio signal is a reflection of the first audio signal. *See* '460 Patent, claim 15. Additionally, the program logic, when executed, causes the playback device to be operable to (i) in response to detecting the second audio signal, determine a first reflection characteristic based on at least the second audio signal, (ii) adjust an equalization setting of the playback device based on at least the first reflection characteristic, and (iii) play, via the speaker, an audio track according to the adjusted equalization setting. *Id.*

COUNT I: INFRINGEMENT OF U.S. PATENT NO. 9,967,615

80. Sonos incorporates by reference and re-alleges paragraphs 1-79 of this Complaint as if fully set forth herein.

81. Google and/or users of the Google Wireless Audio System have directly infringed (either literally or under the doctrine of equivalents) and continue to directly infringe one or more of the claims of the '615 Patent, in violation of 35 U.S.C. § 271(a), by making, using, offering for sale, and/or selling the Google Wireless Audio System within the United States and/or importing the Google Wireless Audio System into the United States without authority or license.

82. As just one non-limiting example, set forth below is an exemplary infringement claim chart for claim 13 of the '615 Patent in connection with the Google Wireless Audio System. This claim chart is based on publicly available information. Sonos reserves the right to modify this claim chart, including, for example, on the basis of information about the Google Wireless Audio System that it obtains during discovery.

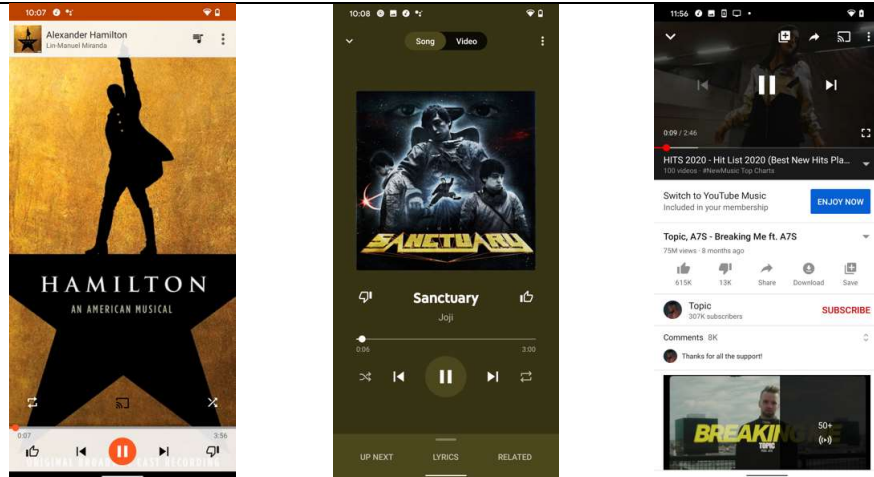
Claim: 13	Chromecast-Enabled Computing Devices
A tangible, non-transitory computer readable storage	At least each smartphone, tablet, and computer running the YouTube Music app, the Google Play Music app, the YouTube app and/or other native or web-based Chromecast-enabled apps (where a computing

<p>medium including instructions for execution by a processor, the instructions, when executed, cause a control device to implement a method comprising:</p>	<p>device installed with at least one of these Chromecast-enabled apps is referred to herein as a “Chromecast-enabled computing device”^{1,2}) comprises a “control device,” as recited in claim 13. At least each Home Mini, Nest Mini, Home, Home Max, Home Hub, Nest Hub, Nest Hub Max, Nest Wifi Point, Chromecast, Chromecast Audio, Chromecast Ultra, Chromecast with Google TV, and Nest Audio (“Chromecast-enabled media player”) is a data network device configured to process and output audio, and thus, comprises a “playback device” as recited in claim 13. <i>See, e.g.,</i> https://store.google.com/us/magazine/compare_pixel; https://store.google.com/us/product/google_pixelbook_specs; https://store.google.com/us/product/pixel_slate_specs; https://store.google.com/us/product/google_home_max?hl=en-US; https://store.google.com/us/product/google_home_max_partners?hl=en-US; https://store.google.com/product/chromecast_apps?utm_source=chromecast.com.</p> <p>In addition to being a “playback device” as recited in claim 13, each Home Hub, Nest Hub, and Nest Hub Max (referred to herein as a “Hub media player”) is installed with Home/Nest Hub controller software such that the given Hub media player also comprises a “control device,” as recited in claim 13. <i>See, e.g.,</i> https://store.google.com/us/product/google_nest_hub?hl=en-US#overview-modal-music; https://store.google.com/us/product/google_nest_hub_max?hl=en-US; https://support.google.com/googlenest/answer/9165738?hl=en-GB&ref_topic=7030084.</p> <p>Each Chromecast-enabled computing device includes a tangible, non-transitory computer-readable storage medium comprising instructions that, when executed by a Chromecast-enabled computing device’s processor, cause that Chromecast-enabled computing device to perform the functions identified below. <i>See, e.g.,</i> https://store.google.com/us/magazine/compare_pixel; https://store.google.com/us/product/google_pixelbook_specs; https://store.google.com/us/product/pixel_slate_specs. Likewise, each</p>
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¹ Any reference to a “Chromecast-enabled computing device” or “Chromecast-enabled media player” includes each version and generation of such device/player unless otherwise noted.

² Each Google “Pixel” smartphone, tablet, and computer (*e.g.*, the Pixel 3, Pixel 3 XL, Pixel 3a, Pixel 3a XL, Pixel 4, Pixel 4 XL, and Pixel 4a phones, the Pixel Slate tablet, and the Pixelbook and Pixelbook Go laptops) running the YouTube Music app, the Google Play Music app, the YouTube app, the Google Home app, and/or other native or web-based Chromecast-enabled app is an example of a “Chromecast-enabled computing device.”

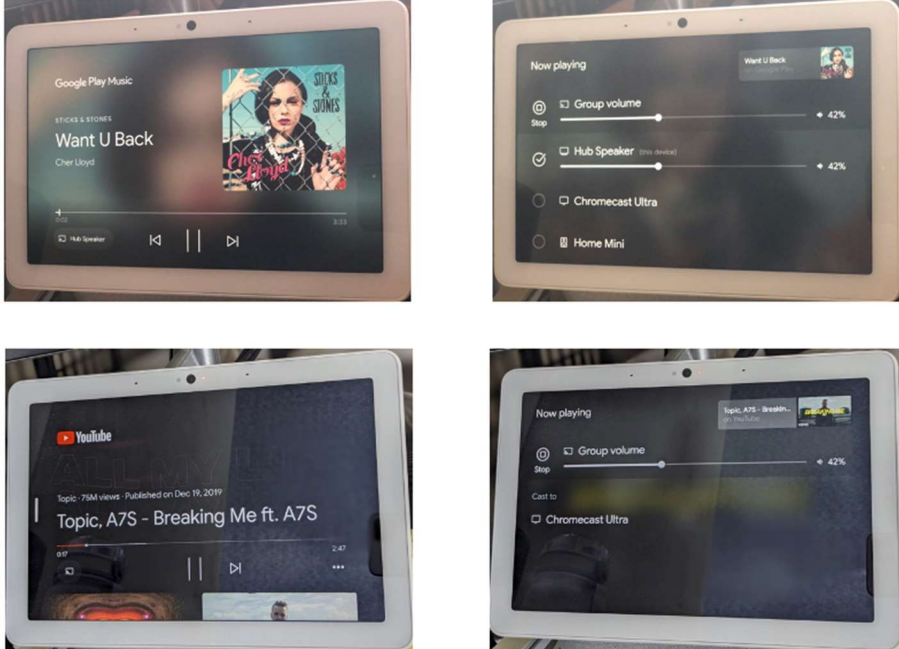
	<p>Hub media player includes a tangible, non-transitory computer-readable storage medium comprising instructions that, when executed by a Hub media player's processor, cause that Hub media player to perform the functions identified below. <i>See, e.g.,</i> https://store.google.com/us/product/google_home_max?hl=en-US.</p>
causing a graphical interface to display a control interface including one or more transport controls to control playback by the control device;	<p>Each Chromecast-enabled computing device comprises instructions that, when executed by a Chromecast-enabled computing device's processor, cause its graphical interface to display a control interface including one or more transport controls to control playback by the Chromecast-enabled computing device.</p> <p>For instance, each Chromecast-enabled computing device is programmed with the capability to cause its graphical interface to display a control interface having one or more transport controls that, at times, are configured to control the Chromecast-enabled computing device's playback of multimedia content from a streaming content service, among other media sources. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084 ("You can even use your mobile device or tablet as a remote and control everything from playback to volume."); https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en ("Using your phone or tablet: [] You can use the playback controls on the Google Play Music app . . . Using your computer: [] You can use the playback controls on Google Play Music, near the bottom of the screen."); https://support.google.com/chromecast/answer/2995235?hl=en-AU; https://support.google.com/googlenest/answer/7030379?co=GENIE.Platform%3DAndroid&hl=en-GB; https://support.google.com/chromecast/answer/3265953?hl=en-GB&ref_topic=4602553. Examples of this functionality are illustrated in the following screenshots from a Chromecast-enabled computing device running at least the YouTube Music, Google Play Music, and YouTube apps:</p>








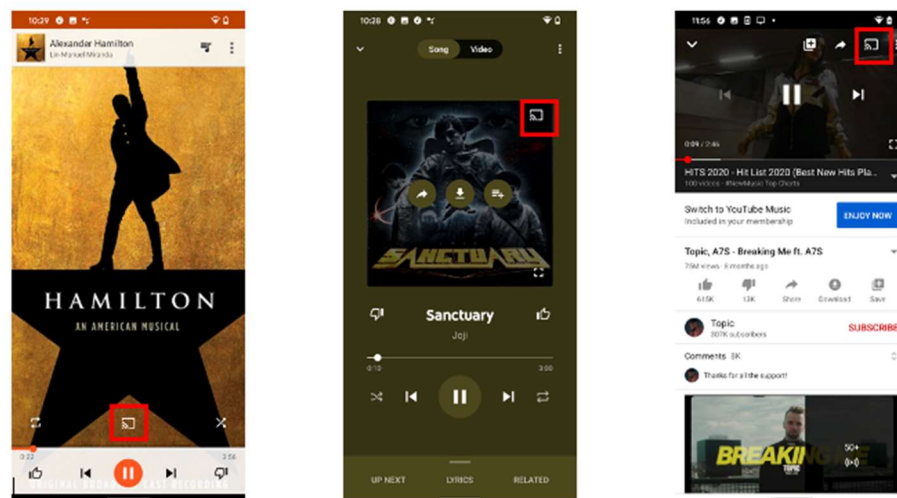
Likewise, each Hub media player comprises instructions that, when executed by a Hub media player's processor, cause its graphical interface to display a control interface including one or more transport controls to control playback by the Hub media player.

For instance, each Hub media player is programmed with the capability to cause its graphical interface to display a control interface having one or more transport controls that, at times, are configured to control the Hub media player's playback of multimedia content from a streaming content service, among other media sources. *See, e.g.,* https://store.google.com/us/product/google_nest_hub?hl=en-US#overview-modal-music ("YouTube Music on demand. . . . Stream top music services."); https://store.google.com/us/product/google_nest_hub_max?hl=en-US ("jam out with YouTube Music."); https://support.google.com/googlenest/answer/9165738?hl=en-GB&ref_topic=7030084 ("With YouTube built-in to your Google Nest display, you can watch YouTube Originals, how-to videos and much more, seamlessly on your screen."). Examples of this functionality are illustrated in the following screenshots from a Hub media player running at least the YouTube Music, Google Play Music, and YouTube apps:




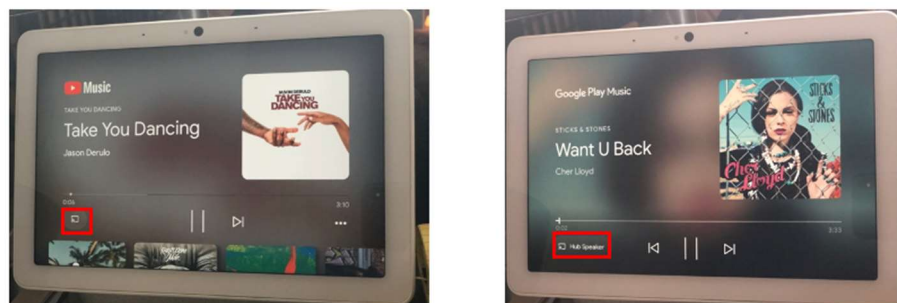
	 <p>The top-left screenshot shows the Google Play Music app interface with the song 'Want U Back' by Cher Lloyd playing. The top-right screenshot shows a volume control interface with sliders for 'Group volume' and 'Hub Speaker', both set to 42%. The bottom-left screenshot shows the YouTube app interface with a video titled 'Topic, A7S - Breaking Me ft. A7S' playing. The bottom-right screenshot shows another volume control interface with sliders for 'Group volume' and 'Chromecast Ultra', both set to 42%.</p>
<p>after connecting to a local area network via a network interface, identifying playback devices connected to the local area network;</p>	<p>Each Chromecast-enabled computing device comprises instructions that, when executed by a Chromecast-enabled computing device's processor, cause that Chromecast-enabled computing device to, after connecting to a local area network ("LAN") via a network interface, identify Chromecast-enabled media players connected to the LAN.</p> <p>For instance, each Chromecast-enabled computing device is programmed such that, after connecting to a LAN, the Chromecast-enabled computing device is configured to identify one or more Chromecast-enabled media players connected to that same LAN. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084 ("Make sure that your mobile device or tablet is connected to the same Wi-Fi network or linked to the same account as your Google Nest or Home speaker or display. . . . Tap the speaker or display for which you'd like to cast."); https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en ("Connect your phone or tablet and Chromecast to the same wireless network. . . . Select your Chromecast device from the device list."); https://support.google.com/chromecast/answer/2995235?hl=en-AU ("Make sure that your mobile device or computer is connected to the same Wi-Fi network as Chromecast. . . . Tap the Chromecast device to which you want to cast."); https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1 ("To show Chrome on your TV, you'll need . . . [t]o connect your computer and Chromecast device to the same Wi-Fi network.");</p>






	<p>https://support.google.com/chromecast/answer/3265953?hl=en-GB&ref_topic=4602553.</p> <p>Likewise, each Hub media player comprises instructions that, when executed by a Hub media player's processor, cause that Hub media player to, after connecting to a LAN via a network interface, identify Chromecast-enabled media players connected to the LAN.</p> <p>For instance, each Hub media player is programmed such that, after connecting to a LAN, the Hub media player is configured to identify one or more Chromecast-enabled media players connected to that same LAN. <i>See</i>, e.g., https://support.google.com/googlenest/answer/9563059?hl=en-GB&ref_topic=7030084 ("At the bottom-left corner of the screen, tap Devices  to see the list of available devices and speaker groups.").</p>
causing the graphical interface to display a selectable option for transferring playback from the control device;	<p>Each Chromecast-enabled computing device comprises instructions that, when executed by a Chromecast-enabled computing device's processor, cause its graphical interface to display a selectable option for transferring playback from the Chromecast-enabled computing device.</p> <p>For instance, each Chromecast-enabled computing device is programmed with the capability to cause its graphical interface to display a selectable option (e.g., a selectable "Cast button") for transferring playback of multimedia content from the Chromecast-enabled computing device to another device (e.g., a Chromecast-enabled media player). <i>See, e.g.</i>, https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084 ("Tap the Cast button . . . Tap the speaker or display for which you'd like to cast."); https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en ("Tap the Cast button . . . Select your Chromecast device from the device list."); https://support.google.com/chromecast/answer/2995235?hl=en-AU ("Tap the Cast button . . . Tap the Chromecast device to which you want to cast."); https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1 ("2. At the top right, click More  > Cast. 3. Choose the Chromecast device where you want to watch the content."); https://support.google.com/chromecast/answer/3265953?hl=en-GB&ref_topic=4602553. Examples of this functionality are illustrated in the following screenshots from a Chromecast-enabled computing device running at least the YouTube Music, Google Play Music, and YouTube apps:</p>



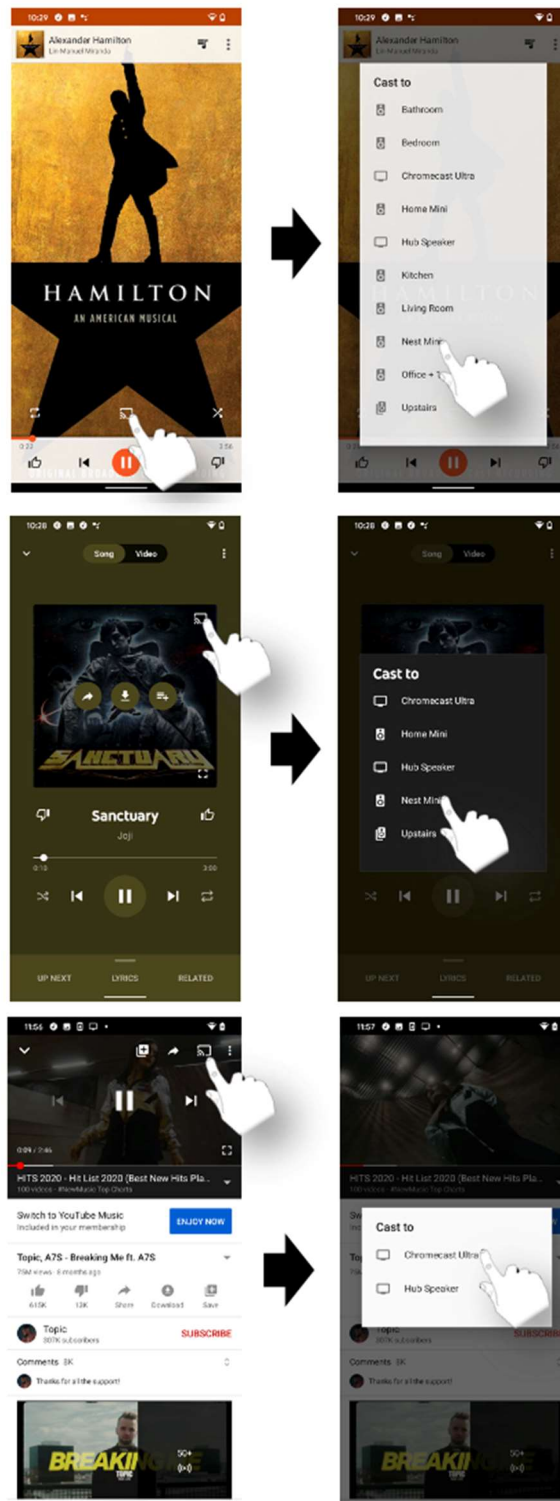
Likewise, each Hub media player comprises instructions that, when executed by a Hub media player's processor, cause its graphical interface to display a selectable option for transferring playback from the Hub media player to another Chromecast-enabled media player.

For instance, each Hub media player is programmed with the capability to cause its graphical interface to display a selectable option (e.g., a selectable "Cast button") for transferring playback of multimedia content from the Hub media player to another device (e.g., a Chromecast-enabled media player). *See, e.g.,* https://support.google.com/googlenest/answer/9563059?hl=en-GB&ref_topic=7030084 ("At the bottom-left corner of the screen, tap Devices  to see the list of available devices and speaker groups. . . . Select the device for which you want to move your media.""). Examples of this functionality are illustrated in the following screenshots from a Hub media player running at least the YouTube Music, Google Play Music, and YouTube apps:




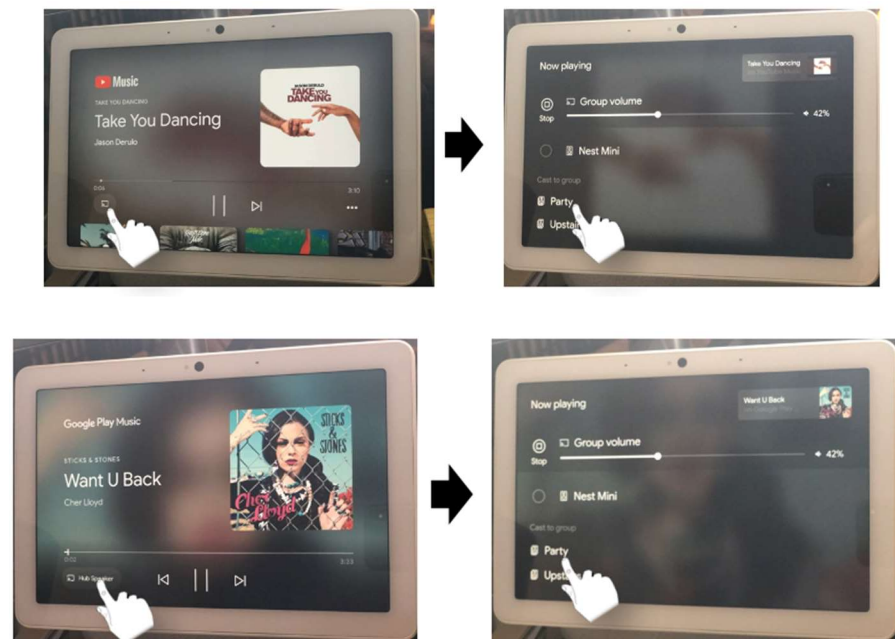
	
<p>detecting a set of inputs to transfer playback from the control device to a particular playback device, wherein the set of inputs comprises: (i) a selection of the selectable option for transferring playback from the control device and (ii) a selection of the particular playback device from the identified playback devices connected to the local area network:</p>	<p>Each Chromecast-enabled computing device comprises instructions that, when executed by a Chromecast-enabled computing device's processor, cause that Chromecast-enabled computing device to detect a set of inputs to transfer playback from the Chromecast-enabled computing device to a particular Chromecast-enabled media player, where the set of inputs comprises: (i) a selection of the selectable option for transferring playback from the Chromecast-enabled computing device and (ii) a selection of the particular Chromecast-enabled media player from the identified Chromecast-enabled media players connected to the LAN.</p> <p>For instance, each Chromecast-enabled computing device is programmed with the capability to (i) detect a selection of a displayed selectable option (e.g., a selectable "Cast button") for transferring playback of multimedia content from the Chromecast-enabled computing device to another device, which triggers the Chromecast-enabled computing device to display a list of available devices for transferring playback that includes one or more identified Chromecast-enabled media players on the same LAN, and then (ii) detect a selection of at least one particular Chromecast-enabled media player connected to the same LAN. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084 ("Tap the Cast button . . . Tap the speaker or display for which you'd like to cast."); https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en ("Tap the Cast button . . . Select your Chromecast device from the device list."); https://support.google.com/chromecast/answer/2995235?hl=en-AU ("Tap the Cast button . . . Tap the Chromecast device to which you want to cast."); https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1 ("2. At the top right, click More  > Cast. 3. Choose the Chromecast device where you want to watch the content."); https://support.google.com/chromecast/answer/3265953?hl=en-GB&ref_topic=4602553. Examples of this functionality are illustrated in the following screenshots from a Chromecast-enabled</p>



computing device running at least the YouTube Music, Google Play Music, and YouTube apps:



Likewise each Hub media player comprises instructions that, when executed by a Hub media player's processor, cause that Hub media player to detect a set of inputs to transfer playback from the Hub media player to a particular Chromecast-enabled media player, where the set of inputs comprises: (i) a selection of the selectable option for transferring playback from the Hub media player and (ii) a selection of the particular Chromecast-enabled media player from the identified Chromecast-enabled media players connected to the LAN.

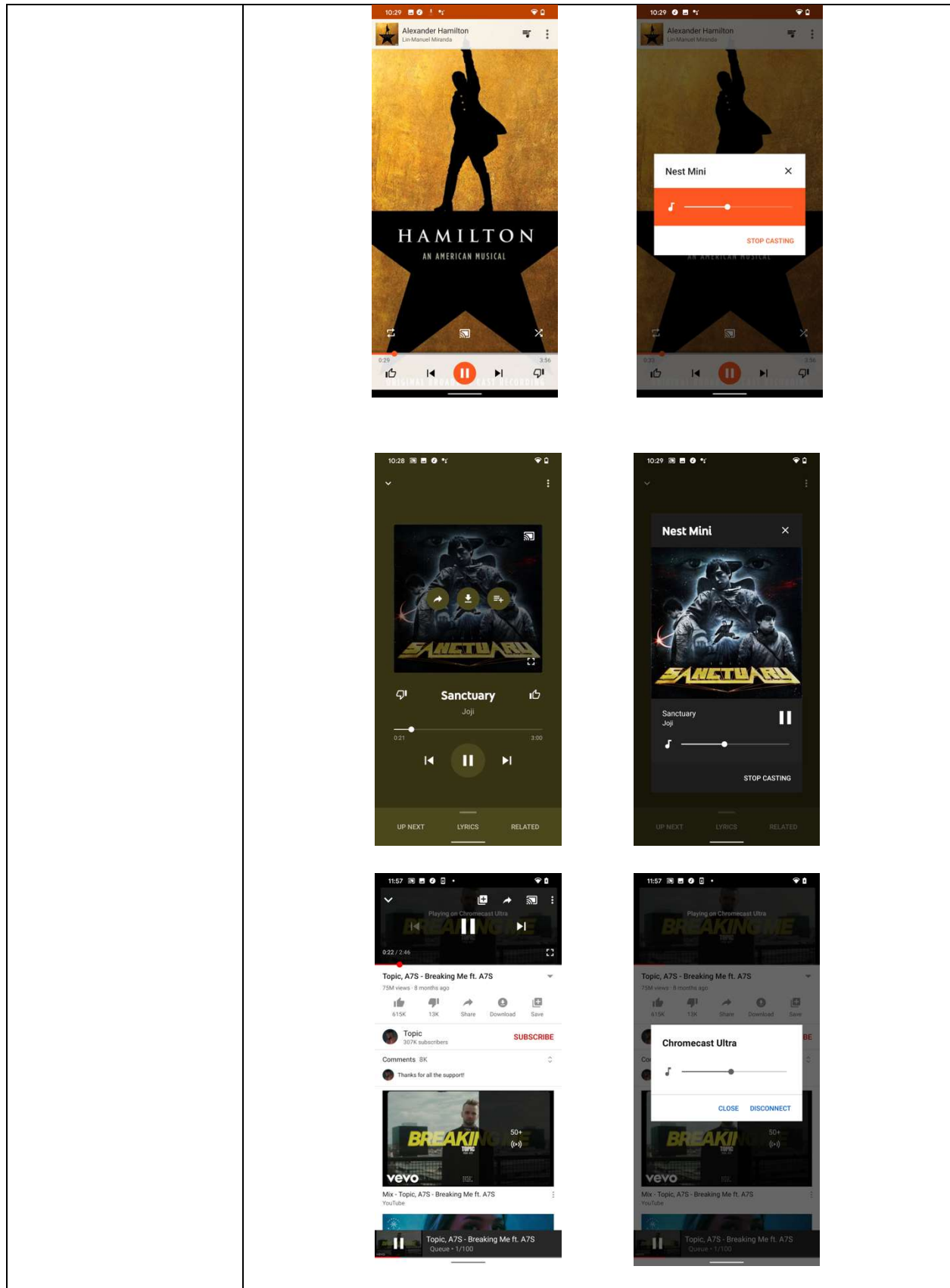
For instance, each Hub media player is programmed with the capability to (i) detect a selection of a displayed selectable option (e.g., a selectable "Cast button") for transferring playback of multimedia content from the Hub media player to another device, which triggers the Hub media player to display a list of available devices for transferring playback that includes one or more identified Chromecast-enabled media players on the same LAN, and then (ii) detect a selection of at least one particular Chromecast-enabled media player connected to the same LAN. *See, e.g.,* https://support.google.com/googlenest/answer/9563059?hl=en-GB&ref_topic=7030084 ("At the bottom-left corner of the screen, tap Devices  to see the list of available devices and speaker groups. . . . Select the device for which you want to move your media.""). Examples of this functionality are illustrated in the following screenshots from a Hub media player running at least the YouTube Music, Google Play Music, and YouTube apps:



	
<p>after detecting the set of inputs to transfer playback from the control device to the particular playback device, causing playback to be transferred from the control device to the particular playback device,</p>	<p>Each Chromecast-enabled computing device comprises instructions that, when executed by a Chromecast-enabled computing device's processor, cause that Chromecast-enabled computing device to, after detecting the set of inputs to transfer playback from the Chromecast-enabled computing device to the particular Chromecast-enabled media player, cause playback to be transferred from the Chromecast-enabled computing device to the particular Chromecast-enabled media player.</p> <p>For instance, each Chromecast-enabled computing device is programmed such that, after detecting a set of inputs to transfer the Chromecast-enabled computing device's playback of multimedia content to at least one particular Chromecast-enabled media player, the Chromecast-enabled computing device causes the playback of the multimedia content to be transferred to the at least one particular Chromecast-enabled media player. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084 (“When you're connected, the Cast button will turn from light to dark grey, letting you know that you're connected.”); https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1 (“To the right of the address bar, next to your extensions, you'll see Active cast .</p> <p>https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en; https://support.google.com/chromecast/answer/2995235?hl=en-AU; https://support.google.com/chromecast/answer/3265953?hl=en-GB&ref_topic=4602553.</p> <p>Likewise, each Hub media player comprises instructions that, when executed by a Hub media player's processor, cause that Hub media player to, after detecting the set of inputs to transfer playback from the Hub media player to the particular Chromecast-enabled media player, cause playback to be transferred from the Hub media player to the particular Chromecast-enabled media player.</p> <p>For instance, each Hub media player is programmed such that, after detecting a set of inputs to transfer the Hub media player's playback</p>

	<p>of multimedia content to at least one particular Chromecast-enabled media player, the Hub media player causes the playback of the multimedia content to be transferred to the at least one particular Chromecast-enabled media player. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/9563059?hl=en-GB&ref_topic=7030084.</p>
<p>wherein transferring playback from the control device to the particular playback device comprises: (a) causing one or more first cloud servers to add multimedia content to a local playback queue on the particular playback device, wherein adding the multimedia content to the local playback queue comprises the one or more first cloud servers adding, to the local playback queue, one or more resource locators corresponding to respective locations of the multimedia content at one or more second cloud servers of a streaming content service; (b) causing playback at the control device to be stopped; and (c) modifying the one or more transport controls of the control interface to control playback by the playback device; and</p>	<p>Each Chromecast-enabled computing device and each Hub media player is programmed such that transferring playback to the particular Chromecast-enabled media player comprises: (a) causing one or more first cloud servers to add multimedia content to a local playback queue on the particular Chromecast-enabled media player, where adding the multimedia content to the local playback queue comprises the one or more first cloud servers adding, to the local playback queue, one or more resource locators corresponding to respective locations of the multimedia content at one or more second cloud servers of a streaming content service, (b) causing playback at the Chromecast-enabled computing device (or Hub media player) to be stopped, and (c) modifying the one or more transport controls of the control interface to control playback by the Chromecast-enabled media player.</p> <p>For instance, on information and belief, each Chromecast-enabled computing device and each Hub media player is programmed such that, after detecting a set of inputs to transfer playback of multimedia content from a streaming content service (e.g., Google Play Music, YouTube Music, YouTube, etc.) to at least one particular Chromecast-enabled media player, the respective control device functions to (a) cause a first cloud server associated with the streaming content service (e.g., a first Google cloud server) to add resource locators for such multimedia content to a local playback queue of the particular Chromecast-enabled media player, where the resource locators correspond to locations of the multimedia content at a second cloud server associated with the streaming content service (e.g., a second Google cloud server), (b) stop its own playback of the multimedia content from the streaming content service, and (c) modify one or more transport controls of its control interface such that the one or more transport controls function to control playback by the at least one particular Chromecast-enabled media player rather than playback by the Chromecast-enabled computing device. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084; https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en; https://support.google.com/chromecast/answer/2995235?hl=en-AU; https://support.google.com/googlenest/answer/9563059?hl=en-GB&ref_topic=7030084;</p>

<p>causing the particular playback device to play back the multimedia content, wherein the particular playback device playing back the multimedia content comprises the particular playback device retrieving the multimedia content from one or more second cloud servers of a streaming content service and playing back the retrieved multimedia content.</p>	<p>https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1.</p> <p>Each Chromecast-enabled computing device comprises instructions that, when executed by a Chromecast-enabled computing device's processor, cause the particular Chromecast-enabled media player to play back the multimedia content, where the particular Chromecast-enabled media player playing back the multimedia content comprises the particular Chromecast-enabled media player retrieving the multimedia content from one or more second cloud servers of a streaming content service and playing back the retrieved multimedia content.</p> <p>For instance, on information and belief, each Chromecast-enabled computing device is programmed such that, after causing the Chromecast-enabled computing device's playback of multimedia content from a streaming content service (e.g., Google Play Music, YouTube Music, YouTube, etc.) to be transferred to at least one particular Chromecast-enabled media player, the Chromecast-enabled computing device causes the at least one particular Chromecast-enabled media player to play back the multimedia content from the streaming content service, which involves the particular Chromecast-enabled media player retrieving the multimedia content from the second cloud server associated with the streaming music service (e.g., the Google cloud server) and then playing back the retrieved multimedia content. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084; https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en; https://support.google.com/chromecast/answer/2995235?hl=en-AU; https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1; https://support.google.com/chromecast/answer/3265953?hl=en-GB&ref_topic=4602553. Examples of this functionality are illustrated in the following screenshots from a Chromecast-enabled computing device running at least the YouTube Music, Google Play Music, and YouTube apps:</p>
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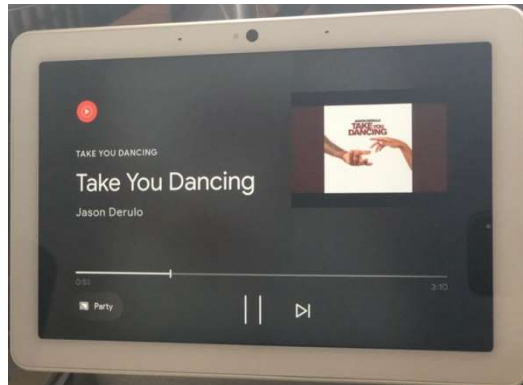


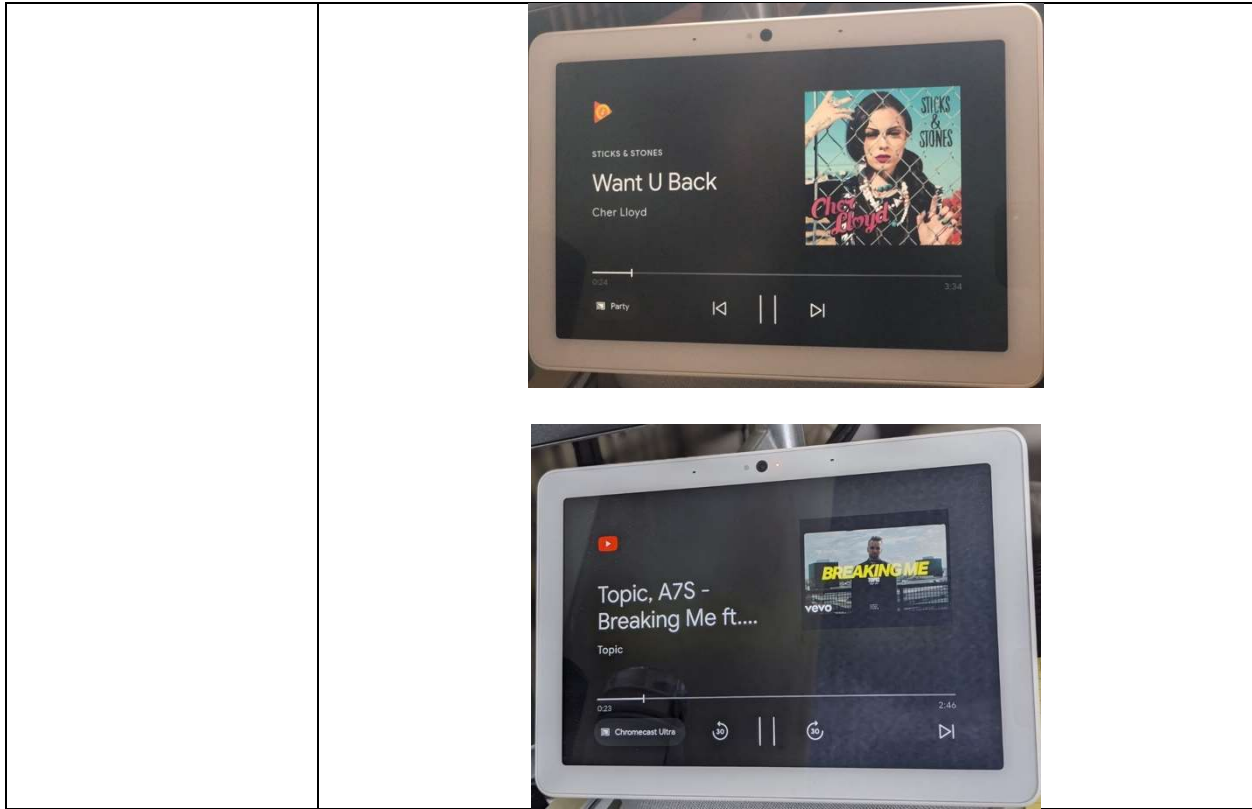
Likewise each Hub media player comprises instructions that, when executed by a Hub media player's processor, cause the particular Chromecast-enabled media player to play back the multimedia content, where the particular Chromecast-enabled media player playing back the multimedia content comprises the particular Chromecast-enabled media player retrieving the multimedia content from one or more second cloud servers of a streaming content service and playing back the retrieved multimedia content.

For instance, on information and belief, each Hub media player is programmed such that, after causing the Hub media player's playback of multimedia content from a streaming content service (e.g., Google Play Music, YouTube Music, YouTube, etc.) to be transferred to at least one particular Chromecast-enabled media player, the Hub media player causes the at least one particular Chromecast-enabled media player to play back the multimedia content from the streaming content service, which involves the particular Chromecast-enabled media player retrieving the multimedia content from the second cloud server associated with the streaming music service (e.g., the second Google cloud server) and then playing back the retrieved multimedia content.

See, e.g.,

https://support.google.com/googlenest/answer/9563059?hl=en-GB&ref_topic=7030084. Examples of this functionality are illustrated in the following screenshots from a Hub media player running at least the YouTube Music, Google Play Music, and YouTube apps:





83. On September 28, 2020, Sonos provided Google with a draft of this complaint prior to its filing. That draft identified the '615 Patent and described how Google's products infringed. Thus, Google had actual knowledge of Sonos's allegation that Google infringed claims of the '615 Patent prior to Sonos filing the complaint in this action.

84. Additionally and/or alternatively, Google has indirectly infringed and continues to indirectly infringe one or more of the claims of the '615 Patent, in violation of 35 U.S.C. § 271(b), by actively inducing users of the Google Wireless Audio System to directly infringe the one or more claims of the '615 Patent. In particular, (a) Google had actual knowledge of the '615 Patent or was willfully blind to its existence prior to, and no later than, February 2019 and had actual knowledge or was willfully blind to Sonos's infringement allegations at least as early as September 28, 2020 when Sonos provided Google a copy of the complaint (*see* ¶¶ 19-29, above), (b) Google intentionally causes, urges, or encourages users of the Google Wireless Audio System to directly infringe one or more claims of the '615 Patent by promoting, advertising, and instructing customers and potential customers about the Google Wireless Audio System

(including uses thereof) and encouraging such customers and potential customers to engage in activity that constitutes direct infringement (*see* Exs. 22-27; *see also* citations above in the exemplary infringement claim chart for claim 13 of the '615 Patent), (c) Google knows (or should know) that its actions will induce users of the Google Wireless Audio System to directly infringe one or more claims the '615 Patent, and (d) users of the Google Wireless Audio System directly infringe one or more claims of the '615 Patent. For instance, at a minimum, Google has supplied and continues to supply the YouTube Music, Google Play Music, and YouTube apps to customers while knowing that installation and/or use of one or more of these apps will infringe one or more claims of the '615 Patent, and that Google's customers then directly infringe one or more claims of the '615 Patent by installing and/or using one or more of the these apps in accordance with Google's product literature. *See, e.g., id.*

85. Additionally and/or alternatively, Google has indirectly infringed and continues to indirectly infringe one or more of the claims of the '615 Patent, in violation of 35 U.S.C. § 271(c), by offering to sell or selling within the United States, and/or importing into the United States, components in connection with the Google Wireless Audio System that contribute to the direct infringement of the '615 Patent by users of the Google Wireless Audio System. In particular, (a) Google had actual knowledge of the '615 Patent or was willfully blind to its existence prior to, and no later than, February 2019 and had actual knowledge or was willfully blind to Sonos's infringement allegations at least as early as September 28, 2020 when Sonos provided Google a copy of the complaint (*see* ¶¶ 19-29 above), (b) Google offers for sale, sells, and/or imports, in connection with the Google Wireless Audio System, one or more material components of the invention of the '615 Patent that are not staple articles of commerce suitable for substantial noninfringing use, (c) Google knows (or should know) that such component(s) were especially made or especially adapted for use in an infringement of the '615 Patent, and (d) users of devices that comprise such material component(s) directly infringe one or more claims of the '615 Patent. For instance, at a minimum, Google offers for sale, sells, and/or imports the YouTube Music, Google Play Music, and YouTube apps for installation on devices (*e.g.*, smartphones, tablets, and

computers) that meet one or more claims of the '615 Patent. *See, e.g.*, Exs. 22-27. These apps are a material component of the devices that meet the one or more claims of the '615 Patent. Further, Google especially made and/or adapted these apps for installation and use on devices that meet the one or more claims of the '615 Patent, and these apps are not a staple article of commerce suitable for substantial noninfringing use. Google's customers then directly infringe the one or more claims of the '615 Patent by installing and/or using these apps on the customers' devices.

86. Google's infringement of the '615 Patent is also willful because Google (a) had actual knowledge of the '615 Patent no later than February 2019 and actual notice of Sonos's infringement contentions no later than September 28, 2020 (*see* ¶¶ 19-29 above), (b) engaged in the aforementioned activity despite an objectively high likelihood that Google's actions constituted infringement of the '615 Patent, and (c) this objectively-defined risk was either known or so obvious that it should have been known to Google.

87. Additional allegations regarding Google's pre-suit knowledge of the '615 Patent and willful infringement will likely have evidentiary support after a reasonable opportunity for discovery.

88. Sonos is entitled to recover from Google all damages that Sonos has sustained as a result of Google's infringement of the '615 Patent, including, without limitation, a reasonable royalty and lost profits.

89. Google's infringement of the '615 Patent was and continues to be willful and deliberate, entitling Sonos to enhanced damages.

90. Google's infringement of the '615 Patent is exceptional and entitles Sonos to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

91. Google's infringement of the '615 Patent has caused irreparable harm (including the loss of market share) to Sonos and will continue to do so unless enjoined by this Court.

COUNT II: INFRINGEMENT OF U.S. PATENT NO. 10,779,033

92. Sonos incorporates by reference and re-alleges paragraphs 1-79 of this Complaint as if fully set forth herein.

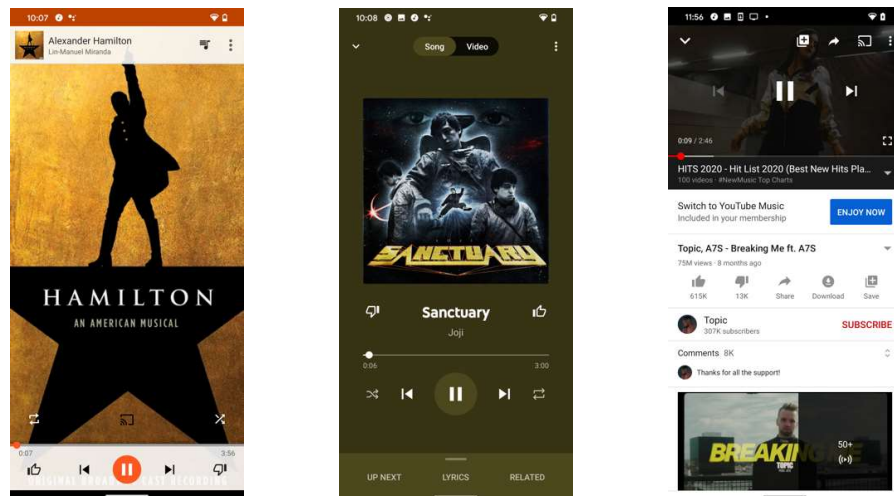
93. Google and/or users of the Google Wireless Audio System have directly infringed (either literally or under the doctrine of equivalents) and continue to directly infringe one or more of the claims of the '033 Patent, in violation of 35 U.S.C. § 271(a), by making, using, offering for sale, and/or selling the Google Wireless Audio System within the United States and/or importing the Google Wireless Audio System into the United States without authority or license.

94. As just one non-limiting example, set forth below is an exemplary infringement claim chart for claim 1 of the '033 Patent in connection with the Google Wireless Audio System. This claim chart is based on publicly available information. Sonos reserves the right to modify this claim chart, including, for example, on the basis of information about the Google Wireless Audio System that it obtains during discovery.

Claim: 1	Chromecast-Enabled Computing Devices
A computing device comprising:	<p>At least each smartphone, tablet, and computer running the YouTube Music app, the Google Play Music app, the YouTube app, and/or other native or web-based Chromecast-enabled apps (where a computing device installed with at least one of these Chromecast-enabled apps is referred to herein as a “Chromecast-enabled computing device”) comprises a “computing device,” as recited in claim 1. At least each Home Mini, Nest Mini, Home, Home Max, Home Hub, Nest Hub, Nest Hub Max, Nest Wifi Point, Chromecast, Chromecast Audio, Chromecast Ultra, Chromecast with Google TV, and Nest Audio (“Chromecast-enabled media player”) is a data network device configured to process and output audio, and thus, comprises a “playback device” as recited in claim 13. <i>See, e.g.,</i> https://store.google.com/us/magazine/compare_pixel; https://store.google.com/us/product/google_pixelbook_specs; https://store.google.com/us/product/pixel_slate_specs; https://store.google.com/us/product/google_home_max?hl=en-US; https://store.google.com/us/product/google_home_max_partners?hl=en-US; https://store.google.com/product/chromecast_apps?utm_source=chromecast.com.</p> <p>In addition to being a “playback device” as recited in claim 1, each Home Hub, Nest Hub, and Nest Hub Max (referred to herein as a “Hub media player”) is installed with Home/Nest Hub controller</p>

	software such that the given Hub media player also comprises a “computing device,” as recited in claim 1. <i>See, e.g.,</i> https://store.google.com/us/product/google_nest_hub?hl=en-US#overview-modal-music ; https://store.google.com/us/product/google_nest_hub_max?hl=en-US ; https://support.google.com/googlenest/answer/9165738?hl=en-GB&ref_topic=7030084 .
at least one processor;	Each Chromecast-enabled computing device and each Hub media player includes at least one processor. <i>See, e.g.,</i> https://store.google.com/us/magazine/compare_pixel ; https://store.google.com/us/product/google_pixelbook_specs ; https://store.google.com/us/product/pixel_slate_specs ; https://store.google.com/us/product/google_home_max?hl=en-US .
a non-transitory computer-readable medium; and	Each Chromecast-enabled computing device and each Hub media player includes a non-transitory computer-readable medium. <i>See, e.g.,</i> https://store.google.com/us/magazine/compare_pixel ; https://store.google.com/us/product/google_pixelbook_specs ; https://store.google.com/us/product/pixel_slate_specs ; https://store.google.com/us/product/google_home_max?hl=en-US .
program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the computing device to perform functions comprising:	Each Chromecast-enabled computing device and each Hub media player includes program instructions stored on the non-transitory computer-readable medium that enable the respective device to perform the functions identified below. <i>See, e.g.,</i> https://store.google.com/us/magazine/compare_pixel ; https://store.google.com/us/product/google_pixelbook_specs ; https://store.google.com/us/product/pixel_slate_specs ; https://store.google.com/us/product/google_home_max?hl=en-US .
operating in a first mode in which the computing device is configured for playback of a remote playback queue provided by a cloud-based computing system associated with a cloud-based media service;	<p>Each Chromecast-enabled computing device comprises instructions that, when executed by a Chromecast-enabled computing device’s processor, cause the Chromecast-enabled computing device to operate in a first mode in which the Chromecast-enabled computing device is configured for playback of a remote playback queue provided by a cloud-based computing system associated with a cloud-based media service.</p> <p>For instance, each Chromecast-enabled computing device is programmed with the capability to operate in a mode in which the Chromecast-enabled computing device is configured for playback of a remote playback queue provided by a Google cloud server associated with a cloud-based media service (e.g., Google Play Music, YouTube Music, YouTube, etc.). <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084; https://support.google.com/chromecast/answer/6178107?co=GENIE.P</p>

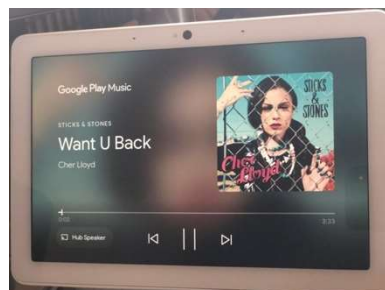
[latform%3DAndroid&hl=en;](#)
<https://support.google.com/chromecast/answer/2995235?hl=en-AU;>
https://support.google.com/googlenest/answer/9563059?hl=en-GB&ref_topic=7030084;
https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1;
https://support.google.com/chromecast/answer/3265953?hl=en-GB&ref_topic=4602553. Examples of this functionality are illustrated in the following screenshots from a Chromecast-enabled computing device running at least the YouTube Music, Google Play Music, and YouTube apps:



Likewise, each Hub media player comprises instructions that, when executed by a Hub media player's processor, cause the Hub media player to operate in a first mode in which the Hub media player is configured for playback of a remote playback queue provided by a cloud-based computing system associated with a cloud-based media service.

For instance, each Hub media player is programmed with the capability to operate in a mode in which the Hub media player is configured for playback of a remote playback queue provided by a Google cloud server associated with a cloud-based media service (e.g., Google Play Music, YouTube Music, YouTube, etc.). *See, e.g.,* https://store.google.com/us/product/google_nest_hub?hl=en-US#overview-modal-music ("YouTube Music on demand. . . . Stream top music services."); https://store.google.com/us/product/google_nest_hub_max?hl=en-US ("jam out with YouTube Music."); https://support.google.com/googlenest/answer/9165738?hl=en-GB&ref_topic=7030084 ("With YouTube built-in to your Google Nest display, you can watch YouTube Originals, how-to videos and





much more, seamlessly on your screen.”). Examples of this functionality are illustrated in the following screenshots from a Hub media player running at least the YouTube Music, Google Play Music, and YouTube apps:

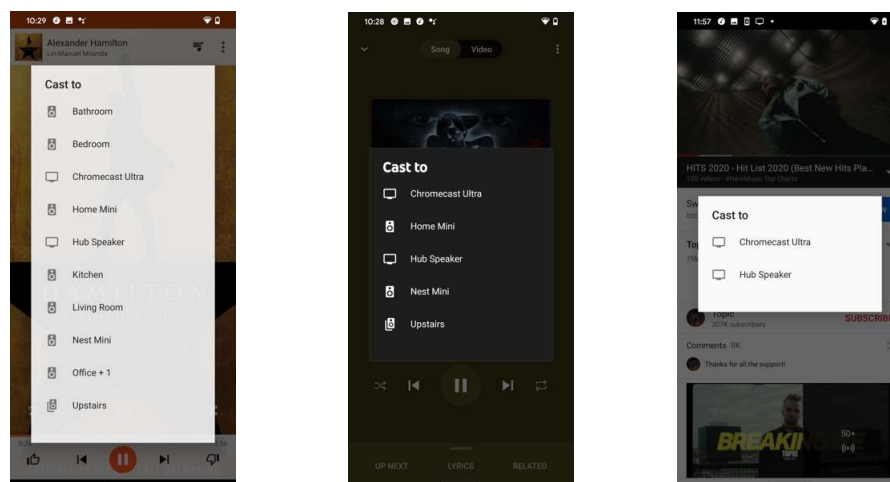


while operating in the first mode, displaying a representation of one or more playback devices in a media playback system that are each i) communicatively coupled to the computing device over a data network and ii) available to accept playback responsibility for the remote playback queue;

Each Chromecast-enabled computing device comprises instructions that, when executed by a Chromecast-enabled computing device's processor, cause the Chromecast-enabled computing device to, while operating in the first mode, display a representation of one or more Chromecast-enabled media players in a Chromecast-enabled playback system that are each (i) communicatively coupled to the Chromecast-enabled computing device over a data network and (ii) available to accept playback responsibility for the remote playback queue.


For instance, each Chromecast-enabled computing device is programmed such that, while operating in a mode in which the Chromecast-enabled computing device is configured for playback of a remote playback queue provided by a Google cloud server associated with a cloud-based media service (e.g., Google Play Music, YouTube Music, YouTube, etc.), the Chromecast-enabled computing device is operable to detect a selection of a displayed selectable option (e.g., a selectable “Cast button”) for transferring playback of multimedia content from the Chromecast-enabled computing device to another device, which triggers the Chromecast-enabled computing device to display a list of available devices for transferring playback that includes one or more Chromecast-enabled media players in a Chromecast-enabled playback system that are each (i) communicatively coupled to the Chromecast-enabled computing device over a local area network (“LAN”) and (ii) available to accept

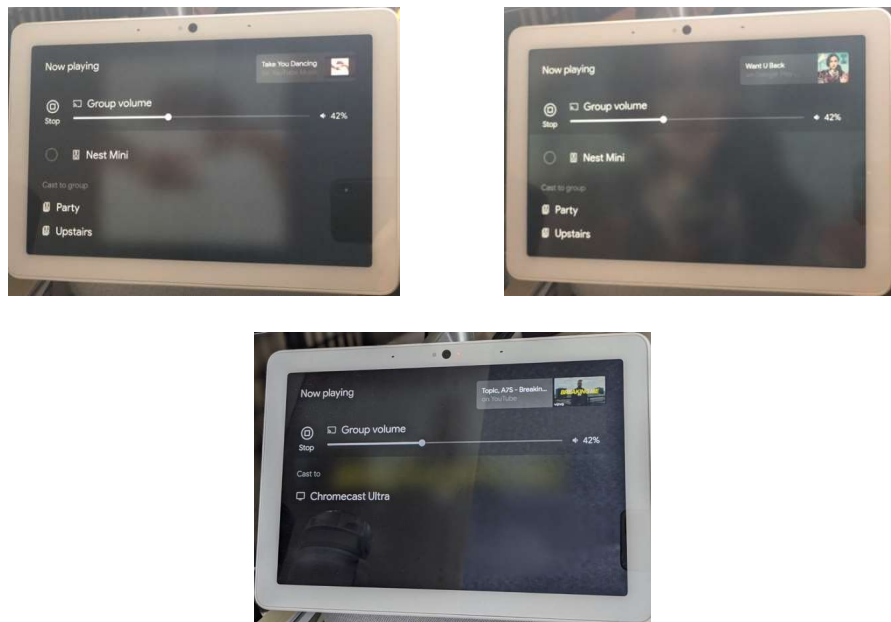
playback responsibility for the remote playback queue. *See, e.g.,* https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084 (“Tap the Cast button . . . Tap the speaker or display for which you'd like to cast.”); <https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en> (“Tap the Cast button . . . Select your Chromecast device from the device list.”); <https://support.google.com/chromecast/answer/2995235?hl=en-AU> (“Tap the Cast button . . . Tap the Chromecast device to which you want to cast.”); https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1 (“2. At the top right, click More  Cast. 3. Choose the Chromecast device where you want to watch the content.”); https://support.google.com/chromecast/answer/3265953?hl=en-GB&ref_topic=4602553. Examples of this functionality are illustrated in the following screenshots from a Chromecast-enabled computing device running at least the YouTube Music, Google Play Music, and YouTube apps:



Likewise, each Hub media player comprises instructions that, when executed by a Hub media player's processor, cause the Hub media player to, while operating in the first mode, display a representation of one or more Chromecast-enabled media players in a Chromecast-enabled playback system that are each (i) communicatively coupled to the Hub media player over a data network and (ii) available to accept playback responsibility for the remote playback queue.

For instance, each Hub media player is programmed such that, while operating in a mode in which the Hub media player is configured for playback of a remote playback queue provided by a Google cloud-based computing system associated with a cloud-based media service

(e.g., Google Play Music, YouTube Music, YouTube, etc.), the Hub media player is operable to detect a selection of a displayed selectable option (e.g., a selectable “Cast button”) for transferring playback of multimedia content from the Hub media player to another device, which triggers the Hub media player to display a list of available devices for transferring playback that includes one or more other Chromecast-enabled media players in a Chromecast-enabled playback system that are each (i) communicatively coupled to the Hub media player over a LAN and (ii) available to accept playback responsibility for the remote playback queue. *See, e.g.,* https://support.google.com/googlenest/answer/9563059?hl=en-GB&ref_topic=7030084 (“At the bottom-left corner of the screen, tap Devices  to see the list of available devices and speaker groups. . . . Select the device for which you want to move your media.”). Examples of this functionality are illustrated in the following screenshots from a Hub media player running at least the YouTube Music, Google Play Music, and YouTube apps:

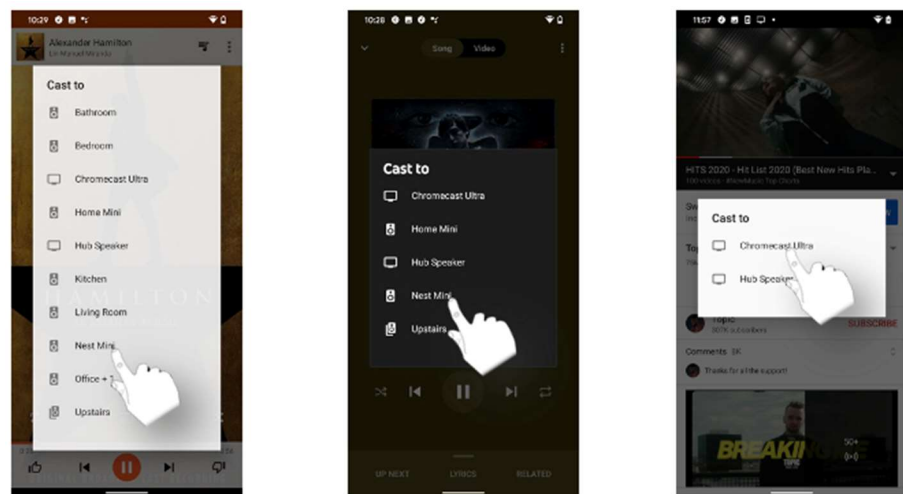


while displaying the representation of the one or more playback devices, receiving user input indicating a selection of at least one given playback device from the one or more playback devices;

Each Chromecast-enabled computing device comprises instructions that, when executed by a Chromecast-enabled computing device’s processor, cause the Chromecast-enabled computing device to, while displaying the representation of the one or more Chromecast-enabled media players, receive user input indicating a selection of at least one given Chromecast-enabled media player from the one or more Chromecast-enabled media players.

For instance, each Chromecast-enabled computing device is programmed such that, while displaying the representation of the one or more Chromecast-enabled media players in a Chromecast-enabled playback system that are each on the same LAN as the Chromecast-

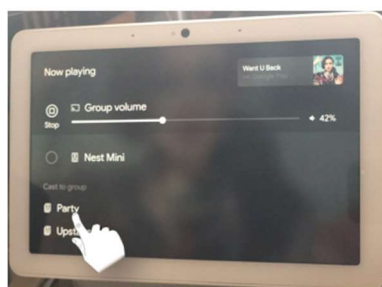
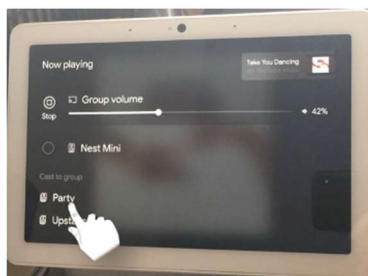
enabled computing device and available to accept playback responsibility for the remote playback queue, the Chromecast-enabled computing device is configured to receive user input indicating a selection of at least one Chromecast-enabled media player in the Chromecast-enabled playback system. *See, e.g.,* https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084 (“Tap the speaker or display for which you'd like to cast.”); <https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en> (“Select your Chromecast device from the device list.”); <https://support.google.com/chromecast/answer/2995235?hl=en-AU> (“Tap the Chromecast device to which you want to cast.”); https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1 (“Choose the Chromecast device where you want to watch the content.”). Examples of this functionality are illustrated in the following screenshots from a Chromecast-enabled computing device running at least the YouTube Music, Google Play Music, and YouTube apps:



Likewise each Hub media player comprises instructions that, when executed by a Hub media player's processor, cause the Hub media player to, while displaying the representation of the one or more Chromecast-enabled media players, receive user input indicating a selection of at least one given Chromecast-enabled media player from the one or more Chromecast-enabled media players.

For instance, each Hub media player is programmed such that, while displaying the representation of the one or more other Chromecast-enabled media players in a Chromecast-enabled playback system that are each on the same LAN as the Hub media player and available to


accept playback responsibility for the remote playback queue, the Hub media player is configured to receive user input indicating a selection of at least one other Chromecast-enabled media player in the Chromecast-enabled playback system. *See, e.g.,* https://support.google.com/googlenest/answer/9563059?hl=en-GB&ref_topic=7030084 (“Select the device for which you want to move your media.”). Examples of this functionality are illustrated in the following screenshots from a Hub media player:



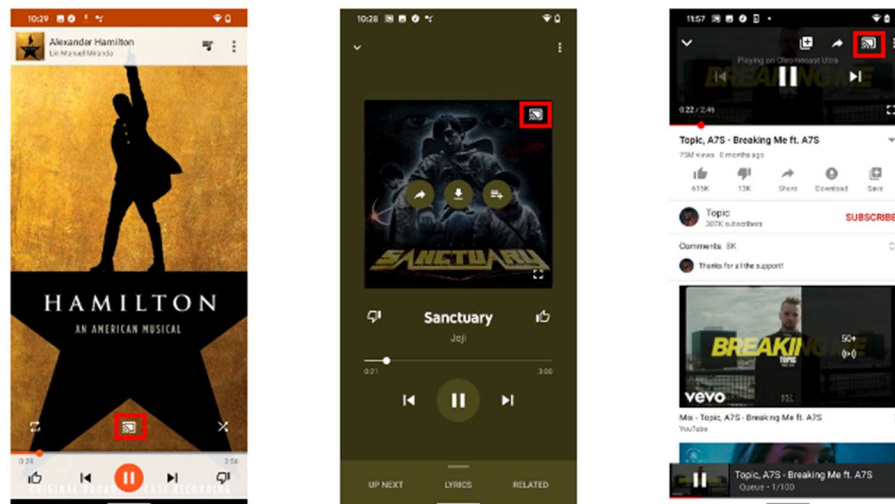
based on receiving the user input, transmitting an instruction for the at least one given playback device to take over responsibility for playback of the remote playback queue from the

Each Chromecast-enabled computing device comprises instructions that, when executed by a Chromecast-enabled computing device's processor, cause the Chromecast-enabled computing device to, based on receiving the user input, transmit an instruction for the at least one given Chromecast-enabled media player to take over responsibility for playback of the remote playback queue from the Chromecast-enabled computing device, wherein the instruction configures the at least one given Chromecast-enabled media player to (i) communicate with the Google cloud-based computing system in order to obtain data identifying a next one or more media items that are in the remote playback queue, (ii) use the obtained data to retrieve at least one

<p>computing device, wherein the instruction configures the at least one given playback device to (i) communicate with the cloud-based computing system in order to obtain data identifying a next one or more media items that are in the remote playback queue, (ii) use the obtained data to retrieve at least one media item in the remote playback queue from the cloud-based media service; and (iii) play back the retrieved at least one media item;</p>	<p>media item in the remote playback queue from the Google cloud-based media service; and (iii) play back the retrieved at least one media item.</p> <p>For instance, on information and belief, each Chromecast-enabled computing device is programmed such that, based on receiving the user input indicating a selection of at least one Chromecast-enabled media player in the Chromecast-enabled playback system that is on the same LAN as the Chromecast-enabled computing device and available to accept playback responsibility for the remote playback queue, the Chromecast-enabled computing device is configured to transmit an instruction for the Chromecast-enabled media player to take over responsibility for playback of the remote playback queue from the Chromecast-enabled computing device, where the instruction configures the Chromecast-enabled media player to (i) communicate with a Google cloud server associated with a Google cloud-based media service (e.g., Google Play Music, YouTube Music, YouTube, etc.) in order to obtain data identifying a next one or more media items that are in the remote playback queue (e.g., resource locators for such media items), (ii) use the obtained data to retrieve at least one media item in the remote playback queue from the Google cloud-based media service; and (iii) play back the retrieved at least one media item. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084; https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en; https://support.google.com/chromecast/answer/2995235?hl=en-AU; https://support.google.com/googlenest/answer/9563059?hl=en-GB&ref_topic=7030084; https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1.</p> <p>Likewise each Hub media player comprises instructions that, when executed by a Hub media player's processor, cause the Hub media player to, based on receiving the user input, transmit an instruction for the at least one given Chromecast-enabled media player to take over responsibility for playback of the remote playback queue from the Hub media player, wherein the instruction configures the at least one given Chromecast-enabled media player to (i) communicate with the Google cloud-based computing system in order to obtain data identifying a next one or more media items that are in the remote playback queue, (ii) use the obtained data to retrieve at least one media item in the remote playback queue from the Google cloud-based media service; and (iii) play back the retrieved at least one media item.</p>
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	<p>For instance, on information and belief, each Hub media player is programmed such that, based on receiving the user input indicating a selection of at least one other Chromecast-enabled media player in the Chromecast-enabled playback system that is on the same LAN as the Hub media player and available to accept playback responsibility for the remote playback queue, the Hub media player is configured to transmit an instruction for the other Chromecast-enabled media player to take over responsibility for playback of the remote playback queue from the Hub media player, where the instruction configures the other Chromecast-enabled media player to (i) communicate with a Google cloud server associated with a Google cloud-based media service (e.g., Google Play Music, YouTube Music, YouTube, etc.) in order to obtain data identifying a next one or more media items that are in the remote playback queue (e.g., resource locators for such media items), (ii) use the obtained data to retrieve at least one media item in the remote playback queue from the Google cloud-based media service; and (iii) play back the retrieved at least one media item. <i>See, e.g., id.</i></p>
<p>detecting an indication that playback responsibility for the remote playback queue has been successfully transferred from the computing device to the at least one given playback device; and</p>	<p>Each Chromecast-enabled computing device comprises instructions that, when executed by a Chromecast-enabled computing device's processor, cause the Chromecast-enabled computing device to detect an indication that playback responsibility for the remote playback queue has been successfully transferred from the Chromecast-enabled computing device to the at least one given Chromecast-enabled media player.</p> <p>For instance, each Chromecast-enabled computing device is programmed with the capability to detect an indication that playback responsibility for the remote playback queue has been successfully transferred from the Chromecast-enabled computing device to at least one Chromecast-enabled media player, which is demonstrated by the fact that the Chromecast-enabled computing device displays an indicator that playback responsibility for the remote playback queue has been successfully transferred to the at least one Chromecast-enabled media player that takes the form of a "Cast button" that is "filled in" and/or "dark grey." <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084 ("When you're connected, the Cast button will turn from light to dark grey, letting you know that you're connected."); https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1 ("To the right of the address bar, next to your extensions, you'll see Active cast .</p> <p>https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en;</p>

<https://support.google.com/chromecast/answer/2995235?hl=en-AU>; https://support.google.com/chromecast/answer/3265953?hl=en-GB&ref_topic=4602553. Examples of a Chromecast-enabled computing device detecting an indication that playback responsibility for the remote playback queue has been successfully transferred from the Chromecast-enabled computing device to at least one Chromecast-enabled media player are illustrated in the following screenshots from a Chromecast-enabled computing device running at least the YouTube Music, Google Play Music, and YouTube apps:



Likewise, each Hub media player comprises instructions that, when executed by a Hub media player's processor, cause the Hub media player to detect an indication that playback responsibility for the remote playback queue has been successfully transferred from the Hub media player to the at least one given Chromecast-enabled media player.

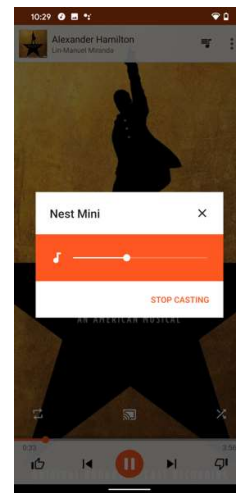
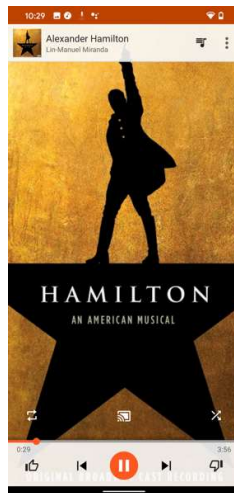
For instance, each Hub media player is programmed with the capability to detect an indication that playback responsibility for the remote playback queue has been successfully transferred from the Hub media player to at least one other Chromecast-enabled media player, which is demonstrated by the fact that the Chromecast-enabled computing device displays an indicator that playback responsibility for the remote playback queue has been successfully transferred to the at least one other Chromecast-enabled media player that takes the form of a "Cast button" that is "filled in" and/or has a "dark grey" color along with a display of the other Chromecast-enabled media player's name. *See, e.g.,*

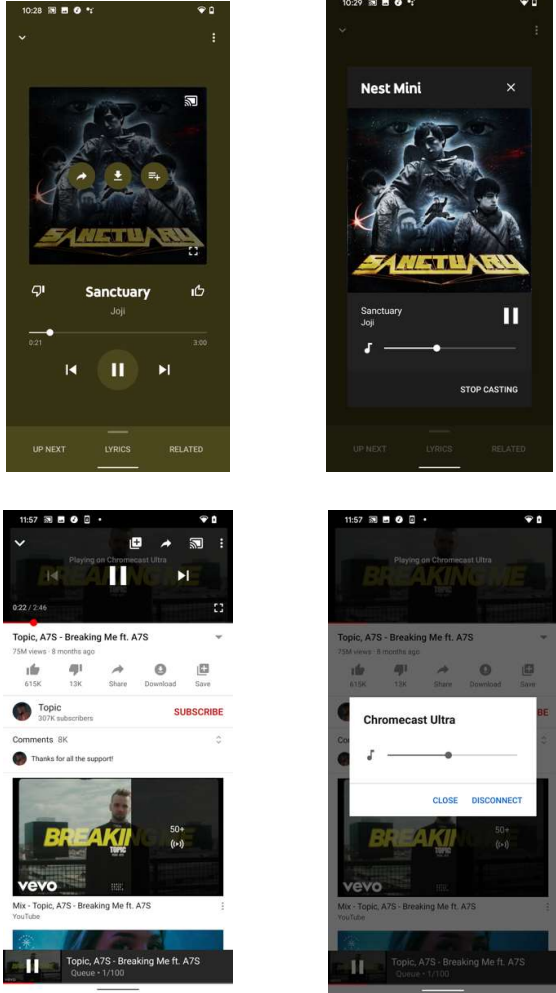
https://support.google.com/googlenest/answer/9563059?hl=en-GB&ref_topic=7030084. Examples of a selectable "Cast button" having this second visual appearance are illustrated in the following

	<p>screenshots from a Hub media player running at least the YouTube Music, Google Play Music, and YouTube apps:</p> 
<p>after detecting the indication, transitioning from i) the first mode in which the computing device is configured for playback of the remote playback queue to ii) a second mode in which the computing device is configured to control the at least one given playback device's playback of the</p>	<p>Each Chromecast-enabled computing device comprises instructions that, when executed by a Chromecast-enabled computing device's processor, cause the Chromecast-enabled computing device to, after detecting the indication, transition from (i) the first mode in which the Chromecast-enabled computing device is configured for playback of the remote playback queue to (ii) a second mode in which the Chromecast-enabled computing device is configured to control the at least one given Chromecast audio player's playback of the remote playback queue and the Chromecast-enabled computing device is no longer configured for playback of the remote playback queue.</p> <p>For instance, each Chromecast-enabled computing device is programmed such that, after detecting the indication that playback responsibility for the remote playback queue has been successfully transferred from the Chromecast-enabled computing device to at least</p>

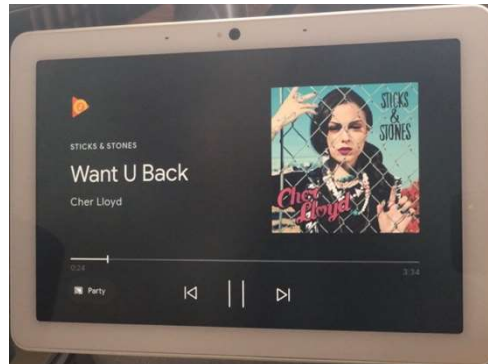
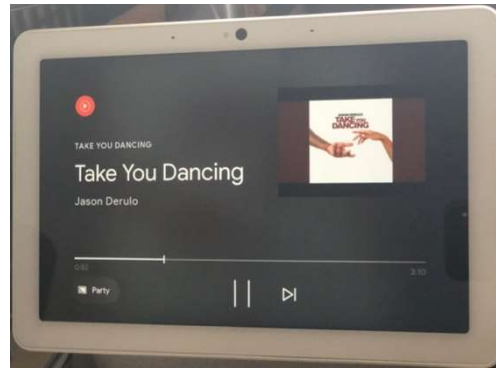
remote playback queue and the computing device is no longer configured for playback of the remote playback queue.

one Chromecast-enabled media player in the Chromecast-enabled playback system that is on the same LAN as the Chromecast-enabled computing device, the Chromecast-enabled computing device is configured to transition from (i) the first mode in which the Chromecast-enabled computing device was configured for playback of the remote playback queue to (ii) a second mode in which the Chromecast-enabled computing device is configured to control the at least one Chromecast-enabled media player's playback of the remote playback queue (while the Chromecast-enabled computing device itself is no longer configured for playback of the remote playback queue). *See, e.g.,* https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084; <https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en>; <https://support.google.com/chromecast/answer/2995235?hl=en-AU>; https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1; https://support.google.com/chromecast/answer/3265953?hl=en-GB&ref_topic=4602553. Examples of a Chromecast-enabled computing device in this second mode are illustrated in the following screenshots from a Chromecast-enabled computing device running at least the YouTube Music, Google Play Music, and YouTube apps:



	 <p>Each Hub media player comprises instructions that, when executed by a Hub media player's processor, cause the Hub media player to, after detecting the indication, transition from (i) the first mode in which the Hub media player is configured for playback of the remote playback queue to (ii) a second mode in which the Hub media player is configured to control the at least one given Chromecast audio player's playback of the remote playback queue and the Hub media player is no longer configured for playback of the remote playback queue.</p> <p>For instance, each Hub media player is programmed such that, after detecting the indication that playback responsibility for the remote playback queue has been successfully transferred from the Hub media player to at least one other Chromecast-enabled media player in the Chromecast-enabled playback system that is on the same LAN as the Hub media player, the Hub media player is configured to transition from (i) the first mode in which the Hub media player was configured for playback of the remote playback queue to (ii) a second mode in which the Hub media player is configured to control the at least one</p>
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other Chromecast-enabled media player's playback of the remote playback queue (while the Hub media player itself is no longer configured for playback of the remote playback queue). *See, e.g.,* https://support.google.com/googlenest/answer/9563059?hl=en-GB&ref_topic=7030084. Examples of a Hub media player in this second mode are illustrated in the following screenshots from a Hub media player running at least the YouTube Music, Google Play Music, and YouTube apps:



95. On September 28, 2020, Sonos provided Google with a draft of this complaint prior to its filing. That draft identified the '033 Patent and described how Google's products

infringed. Thus, Google had actual knowledge of Sonos's allegation that Google infringed claims of the '033 Patent prior to Sonos filing the complaint in this action.

96. Additionally and/or alternatively, Google has indirectly infringed and continues to indirectly infringe one or more of the claims of the '033 Patent, in violation of 35 U.S.C. § 271(b), by actively inducing users of the Google Wireless Audio System to directly infringe the one or more claims of the '033 Patent. In particular, (a) Google had actual knowledge of the '033 Patent and Sonos's infringement contentions, or was willfully blind to their existence, no later than September 28, 2020 when Sonos provided Google with a copy of the complaint (*see* ¶¶ 19-29 above), (b) Google intentionally causes, urges, or encourages users of the Google Wireless Audio System to directly infringe one or more claims of the '033 Patent by promoting, advertising, and instructing customers and potential customers about the Google Wireless Audio System (including uses thereof) and encouraging such customers and potential customers to engage in activity that constitutes direct infringement (*see* Exs. 22-27; *see also* citations above in the exemplary infringement claim chart for claim 1 of the '033 Patent), (c) Google knows (or should know) that its actions will induce users of the Google Wireless Audio System to directly infringe one or more claims the '033 Patent, and (d) users of the Google Wireless Audio System directly infringe one or more claims of the '033 Patent. For instance, at a minimum, Google has supplied and continues to supply the YouTube Music, Google Play Music, and YouTube apps to customers while knowing that installation and/or use of one or more of these apps will infringe one or more claims of the '033 Patent, and that Google's customers then directly infringe one or more claims of the '033 Patent by installing and/or using one or more of these apps in accordance with Google's product literature. *See, e.g., id.*

97. Additionally and/or alternatively, Google has indirectly infringed and continues to indirectly infringe one or more of the claims of the '033 Patent, in violation of 35 U.S.C. § 271(c), by offering to sell or selling within the United States, and/or importing into the United States, components in connection with the Google Wireless Audio System that contribute to the direct infringement of the '033 Patent by users of the Google Wireless Audio System. In particular,

(a) Google had actual knowledge of the '033 Patent and Sonos's infringement contentions, or was willfully blind to their existence, no later than September 28, 2020 when Sonos provided Google with a copy of the complaint (*see* ¶¶ 19-29 above), (b) Google offers for sale, sells, and/or imports, in connection with the Google Wireless Audio System, one or more material components of the invention of the '033 Patent that are not staple articles of commerce suitable for substantial noninfringing use, (c) Google knows (or should know) that such component(s) were especially made or especially adapted for use in an infringement of the '033 Patent, and (d) users of devices that comprise such material component(s) directly infringe one or more claims of the '033 Patent. For instance, at a minimum, Google offers for sale, sells, and/or imports the YouTube Music, Google Play Music, and YouTube apps for installation on devices (*e.g.*, smartphones, tablets, and computers) that meet one or more claims of the '033 Patent. *See, e.g.*, Exs. 22-27. These apps are a material component of the devices that meet the one or more claims of the '033 Patent. Further, Google especially made and/or adapted these apps for installation and use on devices that meet the one or more claims of the '033 Patent, and these apps are not a staple article of commerce suitable for substantial noninfringing use. Google's customers then directly infringe the one or more claims of the '033 Patent by installing and/or using these apps on the customers' devices.

98. Google's infringement of the '033 Patent is also willful because Google (a) had actual knowledge of the '033 Patent and Sonos's infringement contentions no later than September 28, 2020 (*see* ¶¶ 19-29 above), (b) engaged in the aforementioned activity despite an objectively high likelihood that Google's actions constituted infringement of the '033 Patent, and (c) this objectively-defined risk was either known or so obvious that it should have been known to Google.

99. Additional allegations regarding Google's pre-suit knowledge of the '033 Patent and willful infringement will likely have evidentiary support after a reasonable opportunity for discovery.

100. Sonos is entitled to recover from Google all damages that Sonos has sustained as a result of Google's infringement of the '033 Patent, including, without limitation, a reasonable royalty and lost profits.

101. Google's infringement of the '033 Patent was and continues to be willful and deliberate, entitling Sonos to enhanced damages.

102. Google's infringement of the '033 Patent is exceptional and entitles Sonos to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

103. Google's infringement of the '033 Patent has caused irreparable harm (including the loss of market share) to Sonos and will continue to do so unless enjoined by this Court.

COUNT III: INFRINGEMENT OF U.S. PATENT NO. 9,344,206

104. Sonos incorporates by reference and re-alleges paragraphs 1-79 of this Complaint as if fully set forth herein.

105. Google and/or users of the Google Wireless Audio System have directly infringed (either literally or under the doctrine of equivalents) and continue to directly infringe one or more of the claims of the '206 Patent, in violation of 35 U.S.C. § 271(a), by making, using, offering for sale, and/or selling the Google Wireless Audio System within the United States and/or importing the Google Wireless Audio System into the United States without authority or license.

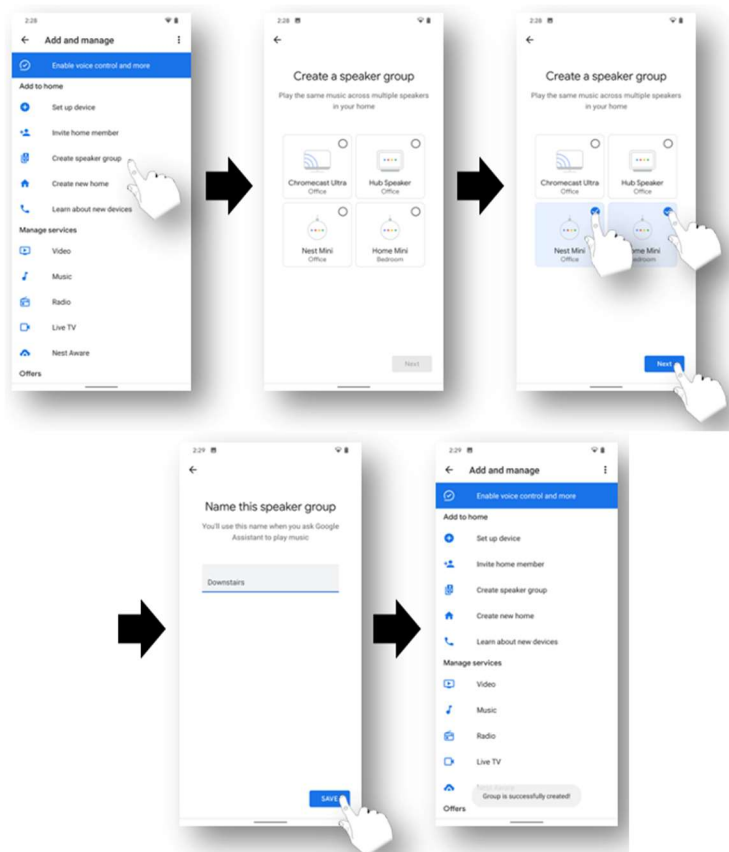
106. As just one non-limiting example, set forth below is an exemplary infringement claim chart for claim 1 of the '206 Patent in connection with the Google Wireless Audio System. This claim chart is based on publicly available information. Sonos reserves the right to modify this claim chart, including, for example, on the basis of information about the Google Wireless Audio System that it obtains during discovery.

Claim: 1	Chromecast-Enabled Computing Devices
A multimedia controller including a processor, the controller configured to:	At least each smartphone, tablet, and computer installed with at least the Google Home app (where a computing device installed with at least the Google Home app is referred to herein as a "Chromecast-enabled computing device") comprises a "multimedia controller including a processor," as recited in claim 1. At least each Home Mini, Nest Mini, Home, Home Max, Home Hub, Nest Hub, Nest Hub

	<p>Max, Nest Wifi Point, Chromecast, Chromecast Audio, Chromecast Ultra, Chromecast with Google TV, and Nest Audio (“Chromecast-enabled media player”) is a data network device configured to process and output audio that is capable of playing multimedia separately from other Chromecast-enabled media players, and thus, comprises an “independent playback device” as recited in claim 1. <i>See, e.g.,</i> https://store.google.com/us/magazine/compare_pixel; https://store.google.com/us/product/google_pixelbook_specs; https://store.google.com/us/product/pixel_slate_specs; https://store.google.com/us/product/google_home_max?hl=en-US; https://store.google.com/us/product/google_home_max_partners?hl=en-US; https://play.google.com/store/apps/details?id=com.google.android.apps.chromecast.app&hl=en_US.</p> <p>In addition to being a “independent playback device” as recited in claim 1, each Home Hub, Nest Hub, and Nest Hub Max (referred to herein as a “Hub media player”) is installed with Home/Nest Hub controller software such that the given Hub media player also comprises a “multimedia controller including a processor,” as recited in claim 1. <i>See, e.g.,</i> https://store.google.com/us/product/google_nest_hub?hl=en-US#overview-modal-music; https://store.google.com/us/product/google_nest_hub_max?hl=en-US; https://support.google.com/googlenest/answer/9165738?hl=en-GB&ref_topic=7030084</p>
<p>receive, via a network interface, a zone configuration from a first independent playback device of a plurality of independent playback devices, wherein the zone configuration is configured via the controller and maintained at the first independent playback device, and wherein the zone configuration characterizes one or more zone scenes, each zone scene</p>	<p>Each Chromecast-enabled computing device is configured to receive, via a network interface, a zone configuration from a first Chromecast-enabled media player of a plurality of Chromecast-enabled media players, where the zone configuration is configured via the Chromecast-enabled computing device, maintained at the first Chromecast-enabled media player, and characterizes one or more zone scenes that each identify a group configuration associated with two or more of the plurality of Chromecast-enabled media players.</p> <p>For instance, each Chromecast-enabled computing device on a local area network (“LAN”) is configured to facilitate creation of predefined “speaker group” comprising two or more Chromecast-enabled media players on the same LAN as the Chromecast-enabled computing device, which is “a zone scene identifying a particular group configuration.” <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7174267?co=GENIE.Platform%3DAndroid&hl=en (providing instructions on how to create “speaker groups”). One example of this functionality is illustrated by the following screenshots, which shows the creation of a predefined</p>

identifying a group configuration associated with two or more of the plurality of independent playback devices; and

“Downstairs” “speaker group” that identifies a particular group configuration comprising the “Nest Mini” and “Home Mini” players:

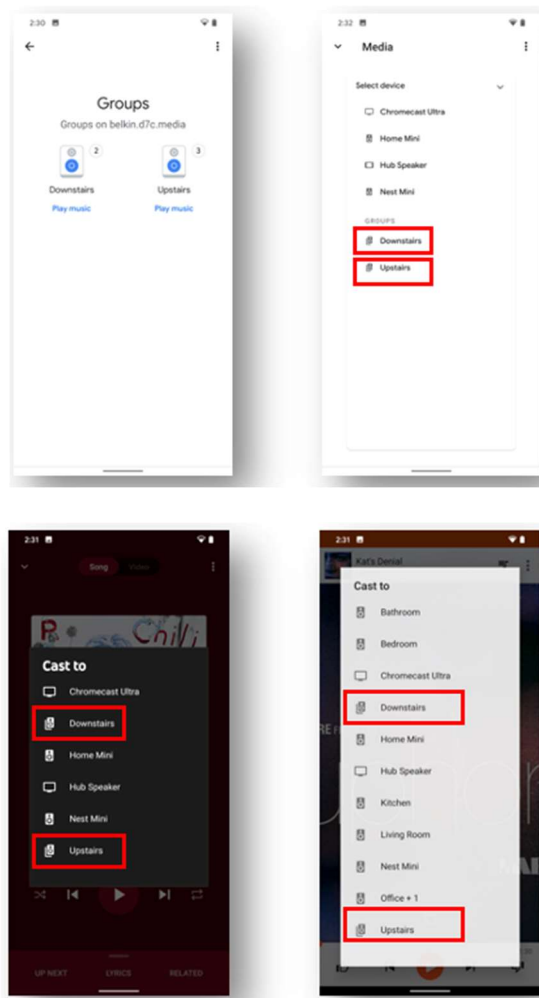


Once the predefined “speaker group” identifying the particular group configuration has been created, a zone configuration characterizing this “speaker group” is maintained at one or more of the plurality Chromecast-enabled media players on the same LAN as the Chromecast-enabled computing device (e.g., one or more of the Chromecast-enabled media players included in the predefined “speaker group”). *See, e.g., id.*

Thereafter, each Chromecast-enabled computing device and each Hub media player on the same LAN as the plurality of Chromecast-enabled media players is operable to receive the zone configuration characterizing the predefined “speaker group” from one or more of the plurality of Chromecast-enabled media players at various times – including in advance of a Chromecast-enabled computing device or Hub media player displaying the predefined “speaker group” as an available option for playback. *See, e.g.,*
<https://support.google.com/googlenest/answer/7174267?co=GENIE.Platform%3DAndroid&hl=en>;
<https://support.google.com/chromecast/answer/6178107?co=GENIE>.

[Platform%3DAndroid&hl=en;](https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1)
[https://support.google.com/googlenest/answer/7030379?co=GENIE.P](https://support.google.com/googlenest/answer/7030379?co=GENIE.Platform%3DAndroid&hl=en-GB;)
[atform%3DAndroid&hl=en-GB;](https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084;)
[https://support.google.com/chromecast/answer/3228332?hl=en-](https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1)
[GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1.](https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1)

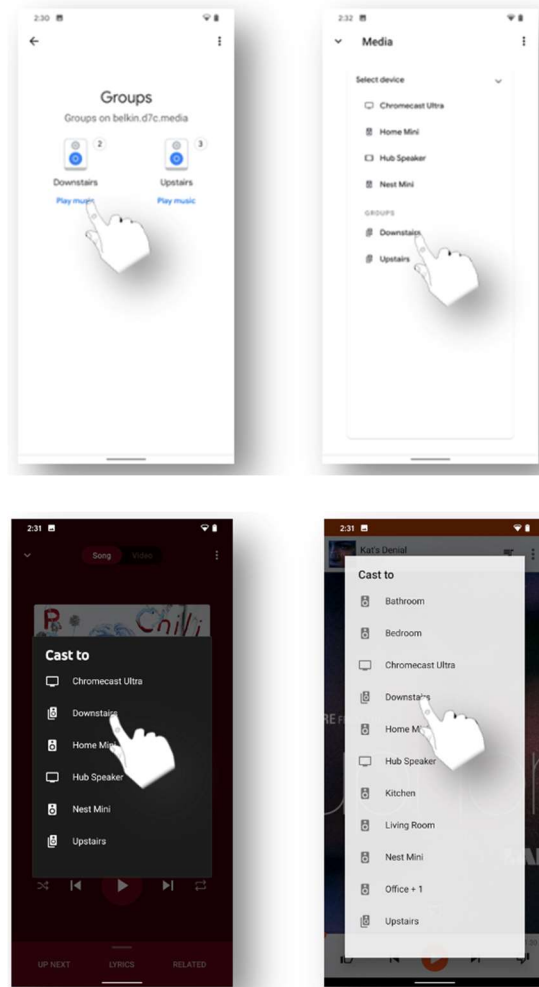
Examples of this functionality are illustrated by the following screenshots from a Chromecast-enabled computing device installed with at least the Google Home, Google Play Music and YouTube Music apps, which show a Chromecast-enabled computing device that has received a zone configuration characterizing a “Downstairs” “speaker group” and a “Upstairs” “speaker group”:



Notably, each Chromecast-enabled computing device and each Hub media player is programmed with the capability to display a predefined “speaker group” as an available option for playback regardless of whether the Chromecast-enabled computing device or

	<p>Hub media player was used to create the predefined “speaker group” (and in fact, regardless of whether the Chromecast-enabled computing device or Hub media player was even powered up or on the same LAN as the plurality of Chromecast-enabled media players at the time that the “speaker group” was created), which demonstrates that each Chromecast-enabled computing device and each Hub media player receives a zone configuration characterizing a predefined “speaker group” from one or more of the Chromecast-enabled media players selected for inclusion in the “speaker group.” <i>See e.g.</i>, https://support.google.com/googlenest/answer/7174267?co=GENIE.Platform%3DAndroid&hl=en.</p> <p>In this regard, to facilitate the above functionality, each Chromecast-enabled computing device and each Hub media player is programmed with the capability to receive, from one of the plurality of Chromecast-enabled media players, a zone configuration characterizing one or more zone scenes that each identify a respective group configuration comprising two or more of the plurality of Chromecast-enabled media players.</p>
cause a selectable indication of the received zone configuration to be displayed, wherein the displayed selectable indication is selectable to cause one or more of the zone scenes to be invoked by two or more of the plurality of independent playback devices.	<p>Each Chromecast-enabled computing device is configured to cause a selectable indication of the received zone configuration to be displayed, where the displayed selectable indication is selectable to cause one or more of the zone scenes to be invoked by two or more of the plurality of Chromecast-enabled media players.</p> <p>For instance, as noted above, each Chromecast-enabled computing device is programmed with the capability to (i) receive a zone configuration characterizing one or more zone scenes that each identify a respective group configuration comprising two or more of the plurality of Chromecast-enabled media players (e.g., one or more “speaker groups”), and (ii) cause an indication of the received zone configuration to be displayed that is selectable to cause a particular zone scene (e.g., a “speaker group”) to be invoked by two or more of the plurality of Chromecast-enabled media players. <i>See, e.g.</i>, https://support.google.com/googlenest/answer/7174267?co=GENIE.Platform%3DAndroid&hl=en; https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en; https://support.google.com/googlenest/answer/7030379?co=GENIE.Platform%3DAndroid&hl=en-GB; https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084; https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1. Examples of this functionality are illustrated by the following screenshots from a Chromecast-enabled computing device running at</p>

least the Google Home, Google Play Music and YouTube Music apps, which show an indication of a received zone configuration characterizing a “Downstairs” “speaker group” that is selectable to cause the “Downstairs” “speaker group” to be invoked by the Chromecast-enabled media players included in the “Downstairs” “speaker group”:



107. On September 28, 2020, Sonos provided Google with a draft of this complaint prior to its filing. That draft identified the '206 Patent and described how Google's products infringed. Thus, Google had actual knowledge of Sonos's allegation that Google infringed claims of the '206 Patent prior to Sonos filing the complaint in this action.

108. Additionally and/or alternatively, Google has indirectly infringed and continues to indirectly infringe one or more of the claims of the '206 Patent, in violation of 35 U.S.C. § 271(b),

by actively inducing users of the Google Wireless Audio System to directly infringe the one or more claims of the '206 Patent. In particular, (a) Google had actual knowledge of the '206 Patent or was willfully blind to its existence prior to, and no later than, October 2016 and had actual knowledge or was willfully blind to Sonos's infringement allegations at least as early as September 28, 2020 when Sonos provided Google a copy of the complaint(see ¶¶ 19-29 above), (b) Google intentionally causes, urges, or encourages users of the Google Wireless Audio System to directly infringe one or more claims of the '206 Patent by promoting, advertising, and instructing customers and potential customers about the Google Wireless Audio System (including uses thereof) and encouraging such customers and potential customers to engage in activity that constitutes direct infringement (*see* Exs. 22-23; *see also* citations above in the exemplary infringement claim chart for claim 1 of the '206 Patent), (c) Google knows (or should know) that its actions will induce users of the Google Wireless Audio System to directly infringe one or more claims the '206 Patent, and (d) users of the Google Wireless Audio System directly infringe one or more claims of the '206 Patent. For instance, at a minimum, Google has supplied and continues to supply the Google Home app to customers while knowing that installation and/or use of this app will infringe one or more claims of the '206 Patent, and that Google's customers then directly infringe one or more claims of the '206 Patent by installing and/or using this app in accordance with Google's product literature. *See, e.g., id.*

109. Additionally and/or alternatively, Google has indirectly infringed and continues to indirectly infringe one or more of the claims of the '206 Patent, in violation of 35 U.S.C. § 271(c), by offering to sell or selling within the United States, and/or importing into the United States, components in connection with the Google Wireless Audio System that contribute to the direct infringement of the '206 Patent by users of the Google Wireless Audio System. In particular, (a) Google had actual knowledge of the '206 Patent or was willfully blind to its existence prior to, and no later than, October 2016 and had actual knowledge or was willfully blind to Sonos's infringement allegations at least as early as September 28, 2020 when Sonos provided Google a copy of the complaint (*see* ¶¶ 19-29 above), (b) Google offers for sale, sells, and/or imports, in

connection with the Google Wireless Audio System, one or more material components of the invention of the '206 Patent that are not staple articles of commerce suitable for substantial noninfringing use, (c) Google knows (or should know) that such component(s) were especially made or especially adapted for use in an infringement of the '206 Patent, and (d) users of devices that comprise such material component(s) directly infringe one or more claims of the '206 Patent. For instance, at a minimum, Google offers for sale, sells, and/or imports the Google Home app for installation on devices (*e.g.*, smartphones, tablets, and computers) that meet one or more claims of the '206 Patent. *See, e.g.*, Exs. 22-23. This app is a material component of the devices that meet the one or more claims of the '206 Patent. Further, Google especially made and/or adapted this app for installation and use on devices that meet the one or more claims of the '206 Patent, and this app is not a staple article of commerce suitable for substantial noninfringing use. Google's customers then directly infringe the one or more claims of the '206 Patent by installing and/or using the Google Home app on the customers' devices.

110. Google's infringement of the '206 Patent is also willful because Google (a) had actual knowledge of the '206 Patent no later than October 2016 and actual knowledge of Sonos's infringement contentions no later than September 28, 2020 (*see* ¶¶ 19-29 above), (b) engaged in the aforementioned activity despite an objectively high likelihood that Google's actions constituted infringement of the '206 Patent, and (c) this objectively-defined risk was either known or so obvious that it should have been known to Google.

111. Additional allegations regarding Google's pre-suit knowledge of the '206 Patent and willful infringement will likely have evidentiary support after a reasonable opportunity for discovery.

112. Sonos is in compliance with any applicable marking and/or notice provisions of 35 U.S.C. § 287 with respect to the '206 Patent.

113. Sonos is entitled to recover from Google all damages that Sonos has sustained as a result of Google's infringement of the '206 Patent, including, without limitation, a reasonable royalty and lost profits.

114. Google's infringement of the '206 Patent was and continues to be willful and deliberate, entitling Sonos to enhanced damages.

115. Google's infringement of the '206 Patent is exceptional and entitles Sonos to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

116. Google's infringement of the '206 Patent has caused irreparable harm (including the loss of market share) to Sonos and will continue to do so unless enjoined by this Court.

COUNT IV: INFRINGEMENT OF U.S. PATENT NO. 10,469,966

117. Sonos incorporates by reference and re-alleges paragraphs 1-79 of this Complaint as if fully set forth herein.

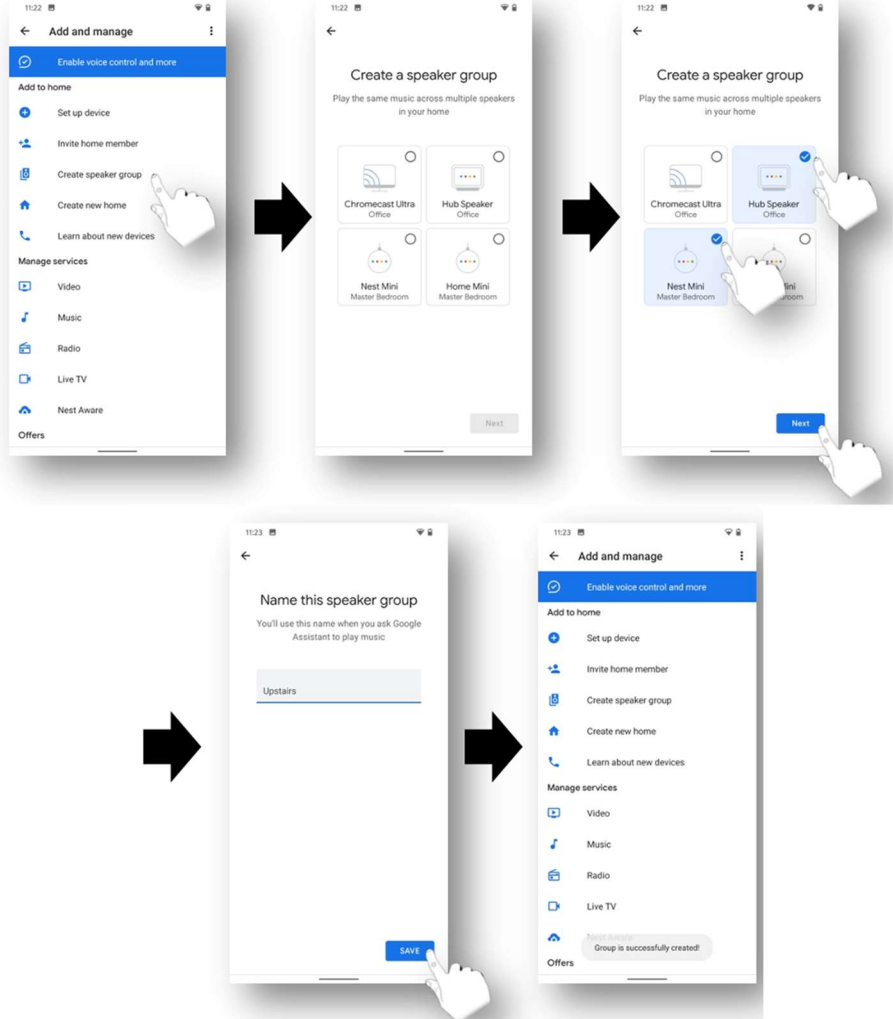
118. Google and/or users of the Google Wireless Audio System have directly infringed (either literally or under the doctrine of equivalents) and continue to directly infringe one or more of the claims of the '966 Patent, in violation of 35 U.S.C. § 271(a), by making, using, offering for sale, and/or selling the Google Wireless Audio System within the United States and/or importing the Google Wireless Audio System into the United States without authority or license.

119. As just one non-limiting example, set forth below is an exemplary infringement claim chart for claim 1 of the '966 Patent in connection with the Google Wireless Audio System. This claim chart is based on publicly available information. Sonos reserves the right to modify this claim chart, including, for example, on the basis of information about the Google Wireless Audio System that it obtains during discovery.

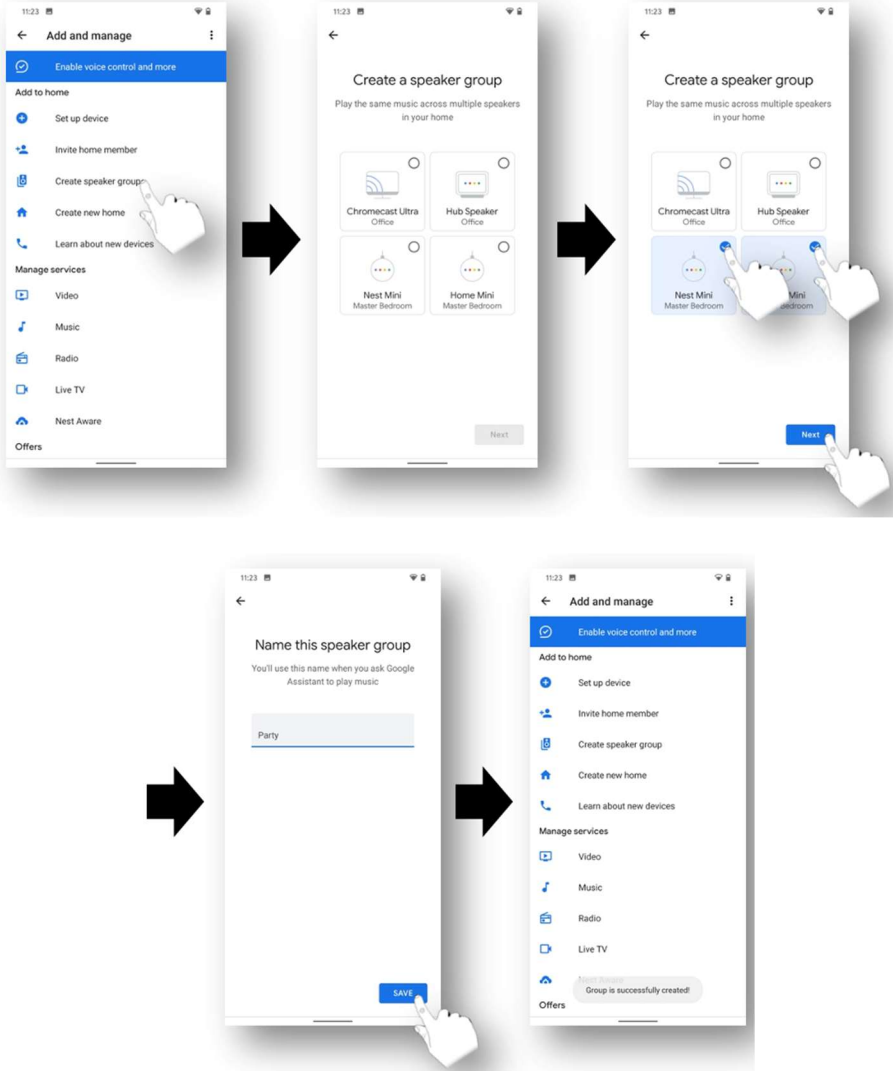
Claim: 1	Chromecast-Enabled Computing Devices
A computing device comprising:	At least each smartphone, tablet, and computer installed with at least the Google Home app (where a computing device installed with at least the Google Home app is referred to herein as a "Chromecast-enabled computing device") comprises a "computing device," as recited in claim 1. At least each Home Mini, Nest Mini, Home, Home Max, Home Hub, Nest Hub, Nest Hub Max, Nest Wifi Point, Chromecast, Chromecast Audio, Chromecast Ultra, Chromecast with Google TV, and Nest Audio ("Chromecast-enabled media player") is a data network device configured to process and output audio, and thus, comprises a "zone player" as recited in claim 1. <i>See, e.g.,</i> https://store.google.com/us/magazine/compare_pixel ;

	https://store.google.com/us/product/google_pixelbook_specs ; https://store.google.com/us/product/pixel_slate_specs ; https://store.google.com/us/product/google_home_max?hl=en-US ; https://store.google.com/us/product/google_home_max_partners?hl=en-US ; https://play.google.com/store/apps/details?id=com.google.android.apps.chromecast.app&hl=en_US .
one or more processors;	Each Chromecast-enabled computing device includes one or more processors. <i>See, e.g.,</i> https://store.google.com/us/magazine/compare_pixel ; https://store.google.com/us/product/google_pixelbook_specs ; https://store.google.com/us/product/pixel_slate_specs .
a non-transitory computer-readable medium; and	Each Chromecast-enabled computing device includes a non-transitory computer-readable medium. <i>See, e.g.,</i> https://store.google.com/us/magazine/compare_pixel ; https://store.google.com/us/product/google_pixelbook_specs ; https://store.google.com/us/product/pixel_slate_specs .
program instructions stored on the non-transitory computer-readable medium that, when executed by the one or more processors, cause the computing device to perform functions comprising:	Each Chromecast-enabled computing device includes program instructions stored on the non-transitory computer-readable medium that enable the Chromecast-enabled computing device to perform the functions identified below. <i>See, e.g.,</i> https://store.google.com/us/magazine/compare_pixel ; https://store.google.com/us/product/google_pixelbook_specs ; https://store.google.com/us/product/pixel_slate_specs .
while serving as a controller for a networked media playback system comprising a first zone player and at least two other zone players, wherein the first zone player is operating in a standalone mode in which the first zone player is configured to play back media individually:	<p>Each Chromecast-enabled computing device comprises program instructions that, when executed by a Chromecast-enabled computing device's one or more processors, cause that Chromecast-enabled computing device to, while serving as a Chromecast-enabled computing device for a Chromecast-enabled playback system comprising a first Chromecast-enabled media player and at least two other Chromecast-enabled media players, where the first Chromecast-enabled media player is operating in a standalone mode in which the first Chromecast-enabled media player is configured to play back media individually, perform the functions identified below.</p> <p>For instance, each Chromecast-enabled computing device is programmed with the capability to serve as a controller for a Chromecast-enabled playback system that includes a first Chromecast-enabled media player and at least two other Chromecast-enabled media players, where at least the first Chromecast-enabled</p>

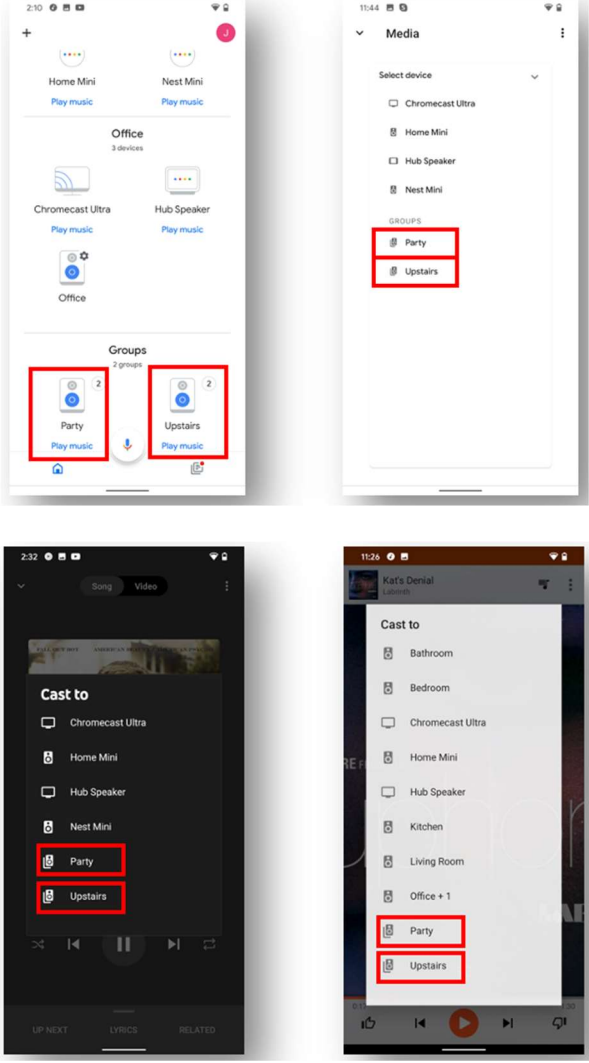
	<p>media player is operating in a standalone mode (<i>i.e.</i>, the first Chromecast-enabled media player is not operating part of an established “cast session” with a “speaker group”). <i>See, e.g.</i>, https://support.google.com/googlenest/answer/7174267?co=GENIE.Platform%3DAndroid&hl=en; https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en; https://support.google.com/googlenest/answer/7030379?co=GENIE.Platform%3DAndroid&hl=en-GB; https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084; https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1.</p>
<p>receiving a first request to create a first zone scene comprising a first predefined grouping of zone players including at least the first zone player and a second zone player that are to be configured for synchronous playback of media when the first zone scene is invoked;</p>	<p>Each Chromecast-enabled computing device comprises program instructions that, when executed by a Chromecast-enabled computing device’s one or more processors, cause that Chromecast-enabled computing device to receive a first request to create a first zone scene comprising a first predefined grouping of Chromecast-enabled media players including at least the first Chromecast-enabled media player and a second Chromecast-enabled media player that are to be configured for synchronous playback of media when the first zone scene is invoked.</p> <p>For instance, each Chromecast-enabled computing device is programmed such that, while serving as a controller for a Chromecast-enabled playback system that includes a first Chromecast-enabled media player and at least two other Chromecast-enabled media players, the Chromecast-enabled computing device is operable to receive a request to create a first predefined “speaker group” that includes the first Chromecast-enabled media player and a second Chromecast-enabled media player in the Chromecast-enabled playback system that are to be configured for synchronous playback of media when the first “speaker group” is launched, which is a “a first zone scene comprising a first predefined grouping of zone players including at least the first zone player and a second zone player that are to be configured for synchronous playback of media when the first zone scene is invoked.” <i>See, e.g.</i>, https://support.google.com/googlenest/answer/7174267?co=GENIE.Platform%3DAndroid&hl=en (providing instructions on how to create “speaker groups” for “synchronous music throughout the home”). One example of this functionality is illustrated by the following screenshots, which shows the creation of an “Upstairs” “speaker group” that includes the “Nest Mini” and “Hub Speaker” players:</p>

	
<p>based on the first request, i) causing creation of the first zone scene, ii) causing an indication of the first zone scene to be transmitted to the first zone player, and iii) causing storage of the first zone scene;</p>	<p>Each Chromecast-enabled computing device comprises program instructions that, when executed by a Chromecast-enabled computing device's one or more processors, cause that Chromecast-enabled computing device to, based on the first request, (i) cause creation of the first zone scene, (ii) cause an indication of the first zone scene to be transmitted to the first Chromecast-enabled media player, and (iii) cause storage of the first zone scene.</p> <p>For instance, each Chromecast-enabled computing device is programmed such that, while serving as a controller for a Chromecast-enabled playback system that includes a first Chromecast-enabled media player and at least two other Chromecast-enabled media players, the Chromecast-enabled computing device is operable to receive a request to create a first predefined "speaker group" including the first Chromecast-enabled media player and a second Chromecast-enabled media player in the Chromecast-enabled playback system (which is the claimed "first zone scene") and then based on the request, (i) cause creation of the first "speaker group,"</p>

	<p>(ii) cause an indication of the first “speaker group” to be transmitted to the first Chromecast-enabled media player, and (iii) cause storage of the first “speaker group” at one or more Chromecast-enabled media players. <i>See e.g.</i>, https://support.google.com/googlenest/answer/7174267?co=GENIE.Platform%3DAndroid&hl=en (providing instructions on how to create “speaker groups”).</p>
<p>receiving a second request to create a second zone scene comprising a second predefined grouping of zone players including at least the first zone player and a third zone player that are to be configured for synchronous playback of media when the second zone scene is invoked, wherein the third zone player is different than the second zone player;</p>	<p>Each Chromecast-enabled computing device comprises program instructions that, when executed by a Chromecast-enabled computing device’s one or more processors, cause that Chromecast-enabled computing device to receive a second request to create a second zone scene comprising a second predefined grouping of Chromecast-enabled media players including at least the first Chromecast-enabled media player and a third Chromecast-enabled media player that are to be configured for synchronous playback of media when the second zone scene is invoked, where the third Chromecast-enabled media player is different than the second Chromecast-enabled media player.</p> <p>For instance, each Chromecast-enabled computing device is programmed such that, while serving as a controller for a Chromecast-enabled playback system that includes a first Chromecast-enabled media player and at least two other Chromecast-enabled media players, the Chromecast-enabled computing device is configured to receive a request to create a first predefined “speaker group” that includes the first Chromecast-enabled media player and a third Chromecast-enabled media player that are to be configured for synchronous playback of media when the second “speaker group” is launched, which is a “a second zone scene comprising a second predefined grouping of zone players including at least the first zone player and a third zone player that are to be configured for synchronous playback of media when the second zone scene is invoked.” <i>See, e.g.</i>, https://support.google.com/googlenest/answer/7174267?co=GENIE.Platform%3DAndroid&hl=en (providing instructions on how to create “speaker groups” for “synchronous music throughout the home”). One example of this functionality is illustrated by the following screenshots, which shows the creation of a “Party” “speaker group” that includes the “Nest Mini” and “Home Mini” players:</p>

	
<p>based on the second request, i) causing creation of the second zone scene, ii) causing an indication of the second zone scene to be transmitted to the first zone player, and iii) causing storage of the second zone scene;</p>	<p>Each Chromecast-enabled computing device comprises program instructions that, when executed by a Chromecast-enabled computing device's one or more processors, cause that Chromecast-enabled computing device to, based on the second request, (i) cause creation of the second zone scene, (ii) cause an indication of the second zone scene to be transmitted to the first Chromecast-enabled media player, and (iii) cause storage of the second zone scene.</p> <p>For instance, each Chromecast-enabled computing device is programmed such that, while serving as a controller for a Chromecast-enabled playback system that includes a first Chromecast-enabled media player and at least two other Chromecast-enabled media players, the Chromecast-enabled computing device is operable to receive a request to create a second predefined "speaker group" including the first Chromecast-enabled media player and a third Chromecast-enabled media player in the Chromecast-enabled playback system (which is the claimed "second zone scene") and then</p>

	<p>based on the request, (i) cause creation of the second “speaker group,” (ii) cause an indication of the second “speaker group” to be transmitted to the first Chromecast-enabled media player, and (iii) cause storage of the second “speaker group” at one or more Chromecast-enabled media players. <i>See e.g.</i>, https://support.google.com/googlenest/answer/7174267?co=GENIE.Platform%3DAndroid&hl=en (providing instructions on how to create “speaker groups”).</p>
displaying a representation of the first zone scene and a representation of the second zone scene; and	<p>Each Chromecast-enabled computing device comprises program instructions that, when executed by a Chromecast-enabled computing device’s one or more processors, cause that Chromecast-enabled computing device to display a representation of the first zone scene and a representation of the second zone scene.</p> <p>For instance, each Chromecast-enabled computing device is programmed such that, while serving as a controller for a Chromecast-enabled playback system that includes a first Chromecast-enabled media player and at least two other Chromecast-enabled media players that are each, the Chromecast-enabled computing device is operable to display (i) a representation of a first predefined “speaker group” including the first Chromecast-enabled media player and a second Chromecast-enabled media player (which is the claimed “first zone scene”), and (ii) a representation of a second predefined “speaker group” including the first Chromecast-enabled media player and a third Chromecast-enabled media player (which is the claimed second zone scene”). <i>See, e.g.</i>, https://support.google.com/googlenest/answer/7174267?co=GENIE.Platform%3DAndroid&hl=en; https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en; https://support.google.com/googlenest/answer/7030379?co=GENIE.Platform%3DAndroid&hl=en-GB; https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084; https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1. Examples of this functionality are illustrated by the following screenshots from a Chromecast-enabled computing device installed with at least the Google Home, Google Play Music, and YouTube Music apps, which show a displayed representation of the “Upstairs” “speaker group” that includes the “Nest Mini” and “Hub Speaker” players, and a displayed representation of the “Party” “speaker group” that includes the “Nest Mini” and “Home Mini” players:</p>

	
<p>while displaying the representation of the first zone scene and the representation of the second zone scene, receiving a third request to invoke the first zone scene; and</p>	<p>Each Chromecast-enabled computing device comprises program instructions that, when executed by a Chromecast-enabled computing device's one or more processors, cause that Chromecast-enabled computing device to, while displaying the representation of the first zone scene and the representation of the second zone scene, receive a third request to invoke the first zone scene.</p> <p>For instance, each Chromecast-enabled computing device is programmed such that, while displaying (i) a representation of a first predefined "speaker group" including the first Chromecast-enabled media player and a second Chromecast-enabled media player (which is the claimed "first zone scene"), and (ii) a representation of a second predefined "speaker group" including the first Chromecast-enabled media player and a third Chromecast-enabled media player (which is the claimed second zone scene"), the Chromecast-enabled computing device is operable to receive a request to launch the first</p>

“speaker group,” which is a “request to invoke the first zone scene.”
See, e.g.,

<https://support.google.com/googlenest/answer/7174267?co=GENIE.Platform%3DAndroid&hl=en>;

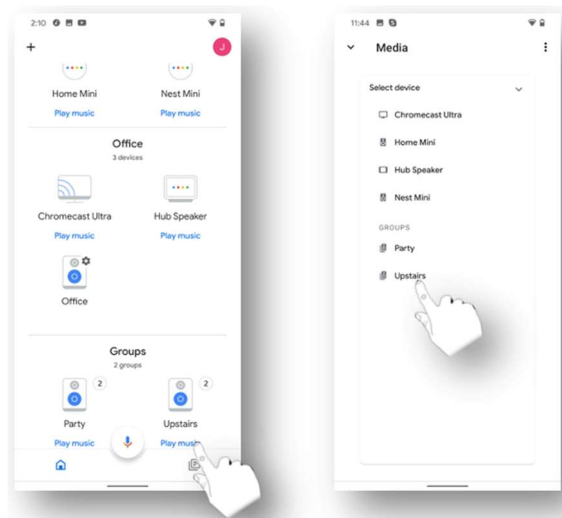
<https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en>;

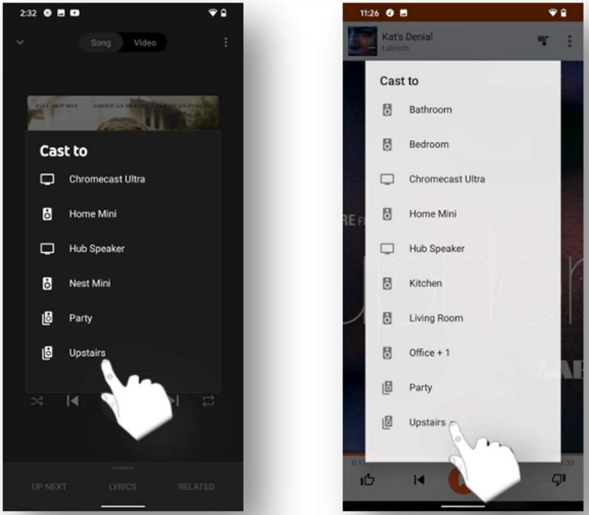
<https://support.google.com/googlenest/answer/7030379?co=GENIE.Platform%3DAndroid&hl=en-GB>;

https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084;

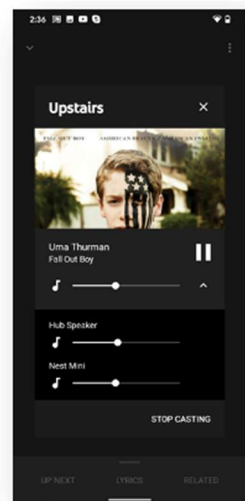
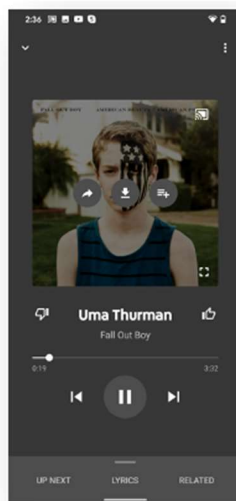
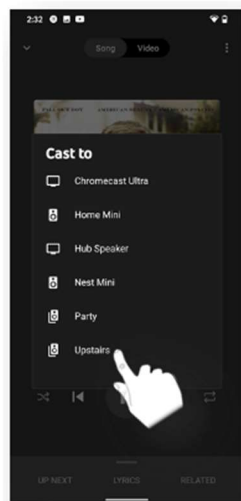
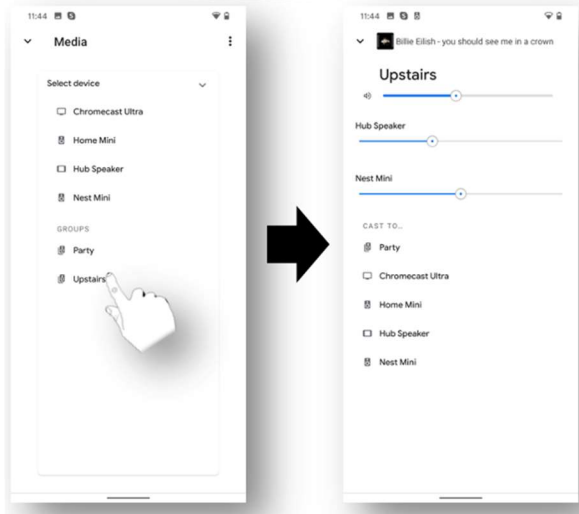
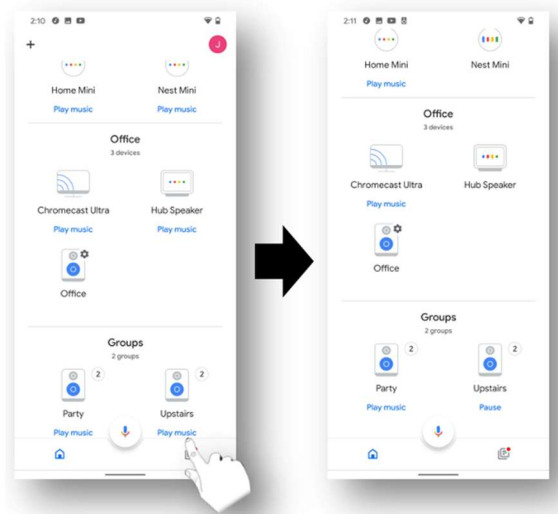
https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1.

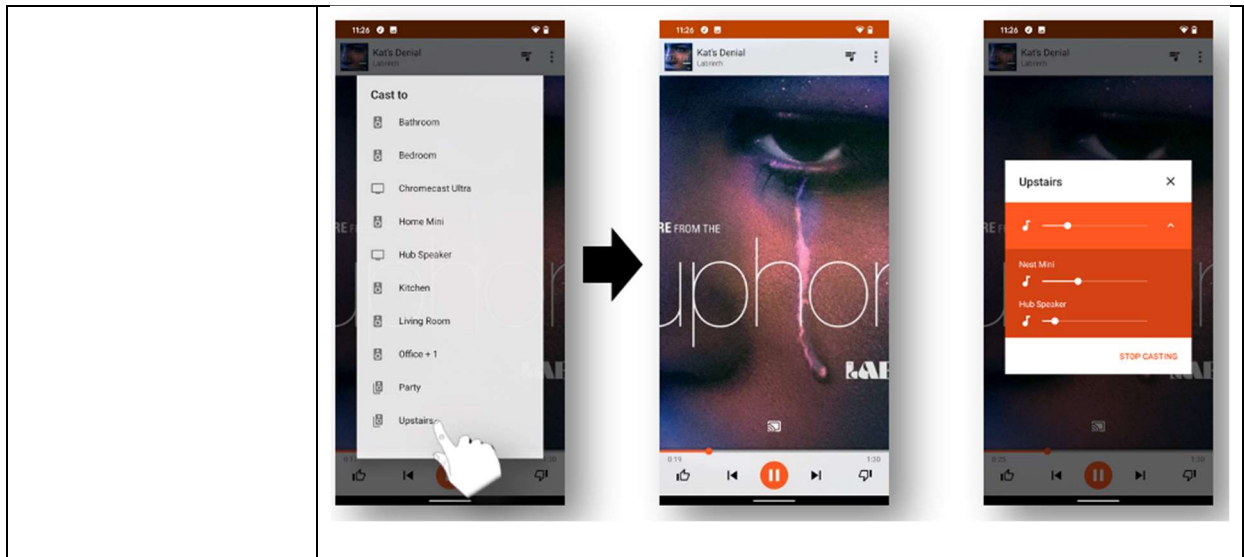
Examples of this functionality are illustrated by the following screenshots from a Chromecast-enabled computing device installed with at least the Google Home, Google Play Music, and YouTube Music apps, which show receipt of a request to launch the “Upstairs” “speaker pair”:



	
<p>based on the third request, causing the first zone player to transition from operating in the standalone mode to operating in accordance with the first predefined grouping of zone players such that the first zone player is configured to coordinate with at least the second zone player to output media in synchrony with output of media by at least the second zone player.</p>	<p>Each Chromecast-enabled computing device comprises program instructions that, when executed by a Chromecast-enabled computing device's one or more processors, cause that Chromecast-enabled computing device to, based on the third request, cause the first Chromecast-enabled media player to transition from operating in the standalone mode to operating in accordance with the first predefined grouping of Chromecast-enabled media players such that the first Chromecast-enabled media player is configured to coordinate with at least the second Chromecast-enabled media player to output media in synchrony with output of media by at least the second Chromecast-enabled media player.</p> <p>For instance, each Chromecast-enabled computing device is programmed such that, based on a request to launch a first "speaker group" (which is the claimed "third request to invoke the first zone scene"), the Chromecast-enabled computing device is operable to cause the first Chromecast-enabled media player to transition from operating in a standalone mode to operating in accordance with the first "speaker group" such that the first Chromecast-enabled media player is configured to coordinate with at least the second Chromecast-enabled media player to output audio in synchrony with the output of audio by the second Chromecast-enabled media player.</p> <p><i>See, e.g.,</i> https://support.google.com/googlenest/answer/7174267?co=GENIE.Platform%3DAndroid&hl=en ("Group any combination of Google Nest or Google Home speakers and displays and Chromecast devices together for synchronous music throughout the home."). Examples of this functionality are illustrated by the following screenshots from a Chromecast-enabled computing device installed with at least the Google Home, Google Play Music, and YouTube Music apps, which show the "Upstairs" "speaker group" being launched such that the</p>

“Nest Mini” and “Hub Speaker” players are configured to coordinate with one another to play audio in synchrony:





120. On September 28, 2020, Sonos provided Google with a draft of this complaint prior to its filing. That draft identified the '966 Patent and described how Google's products infringed. Thus, Google had actual knowledge of Sonos's allegation that Google infringed claims of the '966 Patent prior to Sonos filing the complaint in this action.

121. Additionally and/or alternatively, Google has indirectly infringed and continues to indirectly infringe one or more of the claims of the '966 Patent, in violation of 35 U.S.C. § 271(b), by actively inducing users of the Google Wireless Audio System to directly infringe the one or more claims of the '966 Patent. In particular, (a) Google had actual knowledge of the '966 Patent and Sonos's infringement contentions, or was willfully blind to their existence, no later than September 28, 2020 when Sonos provided Google with a copy of the complaint (*see* ¶¶ 19-29 above), (b) Google intentionally causes, urges, or encourages users of the Google Wireless Audio System to directly infringe one or more claims of the '966 Patent by promoting, advertising, and instructing customers and potential customers about the Google Wireless Audio System (including uses thereof) and encouraging such customers and potential customers to engage in activity that constitutes direct infringement (*see* Exs. 22-23; *see also* citations above in the exemplary infringement claim chart for claim 1 of the '966 Patent), (c) Google knows (or should know) that its actions will induce users of the Google Wireless Audio System to directly infringe

one or more claims the '966 Patent, and (d) users of the Google Wireless Audio System directly infringe one or more claims of the '966 Patent. For instance, at a minimum, Google has supplied and continues to supply the Google Home app to customers while knowing that installation and/or use of this app will infringe one or more claims of the '966 Patent, and that Google's customers then directly infringe one or more claims of the '966 Patent by installing and/or using this app in accordance with Google's product literature. *See, e.g., id.*

122. Additionally and/or alternatively, Google has indirectly infringed and continues to indirectly infringe one or more of the claims of the '966 Patent, in violation of 35 U.S.C. § 271(c), by offering to sell or selling within the United States, and/or importing into the United States, components in connection with the Google Wireless Audio System that contribute to the direct infringement of the '966 Patent by users of the Google Wireless Audio System. In particular, (a) Google had actual knowledge of the '966 Patent and Sonos's infringement contentions, or was willfully blind to their existence, no later than September 28, 2020 when Sonos provided Google with a copy of the complaint (*see* ¶¶ 19-29 above), (b) Google offers for sale, sells, and/or imports, in connection with the Google Wireless Audio System, one or more material components of the invention of the '966 Patent that are not staple articles of commerce suitable for substantial noninfringing use, (c) Google knows (or should know) that such component(s) were especially made or especially adapted for use in an infringement of the '966 Patent, and (d) users of devices that comprise such material component(s) directly infringe one or more claims of the '966 Patent. For instance, at a minimum, Google offers for sale, sells, and/or imports the Google Home app for installation on devices (*e.g.*, smartphones, tablets, and computers) that meet one or more claims of the '966 Patent. *See, e.g.*, Exs. 22-23. This app is a material component of the devices that meet the one or more claims of the '966 Patent. Further, Google especially made and/or adapted this app for installation and use on devices that meet the one or more claims of the '966 Patent, and this app is not a staple article of commerce suitable for substantial noninfringing use. Google's customers then directly infringe the one or more claims of the '966 Patent by installing and/or using the Google Home app on the customers' devices.

123. Google's infringement of the '966 Patent is also willful because Google (a) had actual knowledge of the '966 Patent and actual knowledge of Sonos's infringement contentions no later than September 28, 2020 (*see* ¶¶ 19-29 above), (b) engaged in the aforementioned activity despite an objectively high likelihood that Google's actions constituted infringement of the '966 Patent, and (c) this objectively-defined risk was either known or so obvious that it should have been known to Google.

124. Additional allegations regarding Google's pre-suit knowledge of the '966 Patent and willful infringement will likely have evidentiary support after a reasonable opportunity for discovery.

125. Sonos is in compliance with any applicable marking and/or notice provisions of 35 U.S.C. § 287 with respect to the '966 Patent.

126. Sonos is entitled to recover from Google all damages that Sonos has sustained as a result of Google's infringement of the '966 Patent, including, without limitation, a reasonable royalty and lost profits.

127. Google's infringement of the '966 Patent was and continues to be willful and deliberate, entitling Sonos to enhanced damages.

128. Google's infringement of the '966 Patent is exceptional and entitles Sonos to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

129. Google's infringement of the '966 Patent has caused irreparable harm (including the loss of market share) to Sonos and will continue to do so unless enjoined by this Court.

COUNT V: INFRINGEMENT OF U.S. PATENT NO. 9,219,460

130. Sonos incorporates by reference and re-alleges paragraphs 1-79 of this Complaint as if fully set forth herein.

131. Google and/or users of the Google Wireless Audio System have directly infringed (either literally or under the doctrine of equivalents) and continue to directly infringe one or more of the claims of the '460 Patent, in violation of 35 U.S.C. § 271(a), by making, using, offering for

sale, and/or selling the Google Wireless Audio System within the United States and/or importing the Google Wireless Audio System into the United States without authority or license.

132. As just one non-limiting example, set forth below is an exemplary infringement claim chart for claim 15 of the '460 Patent in connection with the Google Wireless Audio System. This claim chart is based on publicly available information. Sonos reserves the right to modify this claim chart, including, for example, on the basis of information about the Google Wireless Audio System that it obtains during discovery.

Claim: 15	Chromecast-Enabled Media Players
A playback device, comprising:	At least each Google Home Max and Nest Audio player (referred to herein as a "Chromecast-enabled media player") comprises a "playback device," as recited in claim 15.
a speaker;	Each of the foregoing Chromecast-enabled media players includes a speaker. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7072284?hl=en ; https://store.google.com/us/product/google_home_max_specs_speaker?hl=en-US .
a microphone that is physically coupled to the speaker;	Each of the foregoing Chromecast-enabled media players includes a microphone that is physically coupled to the speaker. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7072284?hl=en ; https://store.google.com/us/product/google_home_max_specs_speaker?hl=en-US .
a processor;	Each of the foregoing Chromecast-enabled media players includes a processor. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7072284?hl=en ; https://store.google.com/us/product/google_home_max_specs_speaker?hl=en-US .
a network interface;	Each of the foregoing Chromecast-enabled media players includes a network interface, such as a WiFi interface. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7072284?hl=en ; https://store.google.com/us/product/google_home_max_specs_speaker?hl=en-US .
a data storage; and a program logic stored in the data storage and executable by the processor to:	Each of the foregoing Chromecast-enabled media players includes a data storage and executable program logic stored in the data storage that enable each Chromecast-enabled media player to perform the functions identified below. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7072284?hl=en ; https://store.google.com/us/product/google_home_max_specs_speaker?hl=en-US .

<p>emit a first audio signal from the speaker;</p>	<p>Each of the foregoing Chromecast-enabled media players comprises program logic that, when executed by the Chromecast-enabled media player's processor, causes that Chromecast-enabled media player to emit a first audio signal from the speaker.</p> <p>For instance, each of the foregoing Chromecast-enabled media players is programmed with the capability to emit a first audio signal from one of its speakers to facilitate measuring the acoustics of a space surrounding the Chromecast-enabled media player. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7585574?hl=en ("Once you set up Max, Room EQ measures the acoustics of your space."); https://www.youtube.com/watch?v=UiBhshQ0FQA ("With Smart Sound, Google Home Max uses machine learning to automatically adjust the equalizer settings to match the acoustics of your room.").</p>
<p>detect, via the microphone, a second audio signal, wherein at least a portion of the second audio signal is a reflection of the first audio signal;</p>	<p>Each of the foregoing Chromecast-enabled media players comprises program logic that, when executed by the Chromecast-enabled media player's processor, causes that Chromecast-enabled media player to detect, via its microphone, a second audio signal, wherein at least a portion of the second audio signal is a reflection of the first audio signal.</p> <p>For instance, each of the foregoing Chromecast-enabled media players is programmed with the capability to detect, via its microphone, a second audio signal, where at least a portion of the second audio signal is a reflection of the first audio signal that was emitted to facilitate measuring the acoustics of a space surrounding the Chromecast-enabled media player. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7585574?hl=en ("Once you set up Max, Room EQ measures the acoustics of your space. . . . Note: The microphone must be on for Room EQ to work."); https://www.youtube.com/watch?v=UiBhshQ0FQA (disclosing that the Google Home Max "uses six internal microphones to measure the acoustics of your room.").</p>
<p>in response to the detecting, determine a first reflection characteristic based on at least the second audio signal;</p>	<p>Each of the foregoing Chromecast-enabled media players comprises program logic that, when executed by the Chromecast-enabled media player's processor, causes that Chromecast-enabled media player to, in response to the detecting, determine a first reflection characteristic based on at least the second audio signal.</p> <p>For instance, each of the foregoing Chromecast-enabled media players is programmed such that, in response to detecting a second audio signal comprising a reflection of a first audio signal that was emitted to facilitate measuring the acoustics of a space surrounding the Chromecast-enabled media player, the Chromecast-enabled media player is configured to determine one or more reflection characteristics based on at least the detected second audio signal. <i>See,</i></p>

	<p>e.g., https://support.google.com/googlenest/answer/7585574?hl=en (“Walls in a room can amplify the bass, leading to a muddled sound in which the bass overpowers the vocals of your music. Room EQ automatically corrects for this excess bass. This leads to a more balanced sound.”); https://www.youtube.com/watch?v=UiBhshQ0FQA.</p>
adjust an equalization setting of the playback device based on at least the first reflection characteristic; and	<p>Each of the foregoing Chromecast-enabled media players comprises program logic that, when executed by the Chromecast-enabled media player’s processor, causes that Chromecast-enabled media player to adjust the equalization setting of the Chromecast-enabled media player based on at least the first reflection characteristic.</p> <p>For instance, each of the foregoing Chromecast-enabled media players is programmed with the capability to adjust its equalization setting (e.g., a “bass” setting) based on one or more reflection characteristics. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7585574?hl=en (“Room EQ automatically corrects for this excess bass. This leads to a more balanced sound.”); https://www.youtube.com/watch?v=UiBhshQ0FQA (“With Smart Sound, Google Home Max uses machine learning to automatically adjust the equalizer settings to match the acoustics of your room.”).</p>
play, via the speaker, an audio track according to the equalization setting.	<p>Each of the foregoing Chromecast-enabled media players comprises program logic that, when executed by the Chromecast-enabled media player’s processor, causes that Chromecast-enabled media player to play, via its speaker, an audio track according to the equalization setting.</p> <p>For instance, each of the foregoing Chromecast-enabled media players is programmed with the capability to play, via one of its speakers, audio according to the equalization setting (e.g., “bass” setting) that was adjusted as described above. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7585574?hl=en (“Room EQ automatically corrects for this excess bass. This leads to a more balanced sound.”); https://www.youtube.com/watch?v=UiBhshQ0FQA (“With Smart Sound, Google Home Max uses machine learning to automatically adjust the equalizer settings to match the acoustics of your room.”).</p>

133. On September 28, 2020, Sonos provided Google with a draft of this complaint prior to its filing. That draft identified the ’460 Patent and described how Google’s products infringed. Thus, Google had actual knowledge of Sonos’s allegation that Google infringed claims of the ’460 Patent prior to Sonos filing the complaint in this action.

134. Additionally and/or alternatively, Google has indirectly infringed and continues to indirectly infringe one or more of the claims of the '460 Patent, in violation of 35 U.S.C. § 271(b), by actively inducing users of the Google Wireless Audio System to directly infringe the one or more claims of the '460 Patent. In particular, (a) Google had actual knowledge of the '460 Patent or was willfully blind to its existence prior to, and no later than, January 2018 and had actual knowledge or was willfully blind to Sonos's infringement allegations at least as early as September 28, 2020 when Sonos provided Google a copy of the complaint (*see* ¶¶ 19-29 above), (b) Google intentionally causes, urges, or encourages users of the Google Wireless Audio System to directly infringe one or more claims of the '460 Patent by promoting, advertising, and instructing customers and potential customers about the Google Wireless Audio System (including uses thereof) and encouraging such customers and potential customers to engage in activity that constitutes direct infringement (*see* citations above in the exemplary infringement claim chart for claim 15 of the '460 Patent; *see also* Ex. 42), (c) Google knows (or should know) that its actions will induce users of the Google Wireless Audio System to directly infringe one or more claims of the '460 Patent, and (d) users of the Google Wireless Audio System directly infringe one or more claims of the '460 Patent. For instance, at a minimum, Google has supplied and continues to supply the Google Home Max and Nest Audio to customers while knowing that use of these products will infringe one or more claims of the '460 Patent and that Google's customers then directly infringe one or more claims of the '460 Patent by using the Google Home Max and Nest Audio in accordance with Google's product literature. *See, e.g., id.*

135. Additionally and/or alternatively, Google has indirectly infringed and continues to indirectly infringe one or more of the claims of the '460 Patent, in violation of 35 U.S.C. § 271(c), by offering to sell or selling within the United States, and/or importing into the United States, components in connection with the Google Wireless Audio System that contribute to the direct infringement of the '460 Patent by users of the Google Wireless Audio System. In particular, (a) Google had actual knowledge of the '460 Patent or was willfully blind to its existence prior to, and no later than, January 2018 and had actual knowledge or was willfully blind to Sonos's

infringement allegations at least as early as September 28, 2020 when Sonos provided Google a copy of the complaint (*see* ¶¶ 19-29 above), (b) Google offers for sale, sells, and/or imports, in connection with the Google Wireless Audio System, one or more material components of the invention of the '460 Patent that are not staple articles of commerce suitable for substantial noninfringing use, (c) Google knows (or should know) that such component(s) were especially made or especially adapted for use in an infringement of the '460 Patent, and (d) users of devices that comprise such material component(s) directly infringe one or more claims of the '460 Patent. For instance, at a minimum, Google offers for sale, sells, and/or imports software updates for the Google Home Max and Nest Audio that meet one or more claims of the '460 Patent. *See, e.g.,* Ex. 43. These software updates are material components of the Google Home Max and Nest Audio that meet the one or more claims of the '460 Patent. Further, Google especially made and/or adapted these software updates for installation and use on the Google Home Max and Nest Audio that meet the one or more claims of the '460 Patent, and these software updates are not staple articles of commerce suitable for substantial noninfringing use. Google's customers then directly infringe the one or more claims of the '460 Patent by installing and using software updates on the Google Home Max and Nest Audio.

136. Google's infringement of the '460 Patent is also willful because Google (a) had actual knowledge of the '460 Patent no later than January 2018 and actual notice of Sonos's infringement contentions no later than September 28, 2020 (*see* ¶¶ 19-29 above), (b) engaged in the aforementioned activity despite an objectively high likelihood that Google's actions constituted infringement of the '460 Patent, and (c) this objectively-defined risk was either known or so obvious that it should have been known to Google.

137. Additional allegations regarding Google's pre-suit knowledge of the '460 Patent and willful infringement will likely have evidentiary support after a reasonable opportunity for discovery.

138. Sonos is entitled to recover from Google all damages that Sonos has sustained as a result of Google's infringement of the '460 Patent, including, without limitation, a reasonable royalty and lost profits.

139. Google's infringement of the '460 Patent was and continues to be willful and deliberate, entitling Sonos to enhanced damages.

140. Google's infringement of the '460 Patent is exceptional and entitles Sonos to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. § 285. Google's infringement of the '460 Patent has caused irreparable harm (including the loss of market share) to Sonos and will continue to do so unless enjoined by this Court.

PRAYER FOR RELIEF

WHEREFORE, Sonos respectfully requests:

- A. That Judgment be entered that Google has infringed at least one or more claims of the patents-in-suit, directly and/or indirectly, literally and/or under the doctrine of equivalents, and that such infringement is willful;
- B. An injunction enjoining Google, its officers, agents, servants, employees and attorneys, and other persons in active concert or participation with Google, and its parents, subsidiaries, divisions, successors and assigns, from further infringement of the patents-in-suit.
- C. An award of damages sufficient to compensate Sonos for Google's infringement under 35 U.S.C. § 284, including an enhancement of damages on account of Google's willful infringement;
- D. That the case be found exceptional under 35 U.S.C. § 285 and that Sonos be awarded its reasonable attorneys' fees;
- E. Costs and expenses in this action;
- F. An award of prejudgment and post-judgment interest; and

G. Such other and further relief as the Court may deem just and proper.

DEMAND FOR JURY TRIAL

Pursuant to Rule 38(b) of the Federal Rules of Civil Procedure, Sonos respectfully demands a trial by jury on all issues triable by jury.

Dated: September 29, 2020

Respectfully submitted,

By: /s/

Attorneys for Plaintiff Sonos, Inc.

EXHIBIT 1

US009967615B2

(12) **United States Patent**
Coburn, IV et al.

(10) **Patent No.:** **US 9,967,615 B2**
(45) **Date of Patent:** ***May 8, 2018**

(54) **NETWORKED MUSIC PLAYBACK**

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(71) Applicant: **Sonos, Inc.**, Santa Barbara, CA (US)

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(72) Inventors: **Arthur Coburn, IV**, Cambridge, MA (US); **Joni Hoadley**, Santa Barbara, CA (US)

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(73) Assignee: **Sonos, Inc.**, Santa Barbara, CA (US)

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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This patent is subject to a terminal disclaimer.

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Primary Examiner — Oschat Montoya

(74) *Attorney, Agent, or Firm* — McDonnell Boehnen Hulbert & Berghoff LLP

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(Continued)

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CPC ... **H04N 21/43615** (2013.01); **H04L 65/4084** (2013.01); **H04N 21/4307** (2013.01);
(Continued)

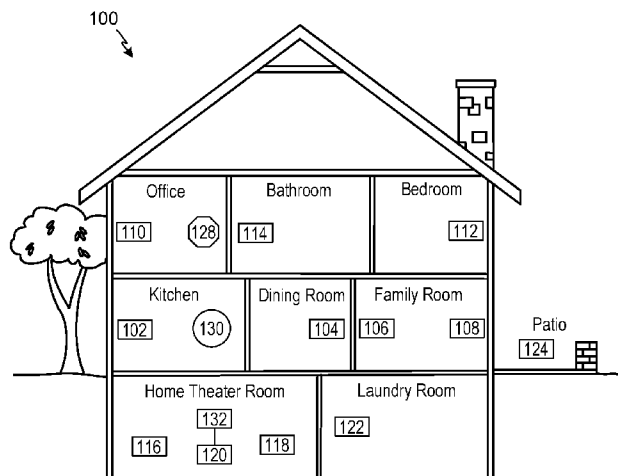
(58) **Field of Classification Search**

CPC H04N 21/43615; H04N 21/6581; H04N 21/439; H04N 21/6125; H04N 21/64322;
(Continued)

ABSTRACT

Systems, methods, apparatus, and articles of manufacture to facilitate connection to a multimedia playback network are disclosed. An example method includes detecting a first input including an identification of a playback device; detecting a second input including an identification of an item on a controller, wherein multimedia content associated with the item is retrievable from a content provider; detecting a trigger, wherein the trigger is not the first input or the second input; and sending, in response to detecting the trigger, information regarding the multimedia content from the controller to the playback device, wherein the information includes an identification of the multimedia content for playback by the playback device, and wherein the information causes (a) the playback device to retrieve, independent of the controller, the multimedia content from the content provider and (b) playback of the retrieved multimedia content.

29 Claims, 11 Drawing Sheets



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- (58) **Field of Classification Search**
- CPC *H04N 21/6587*; *H04N 21/47202*; *H04N 21/4852*; *H04N 21/8113*; *H04N 21/4307*; *H04N 21/4333*; *H04N 21/8586*; *H04L 65/4084*
- See application file for complete search history.
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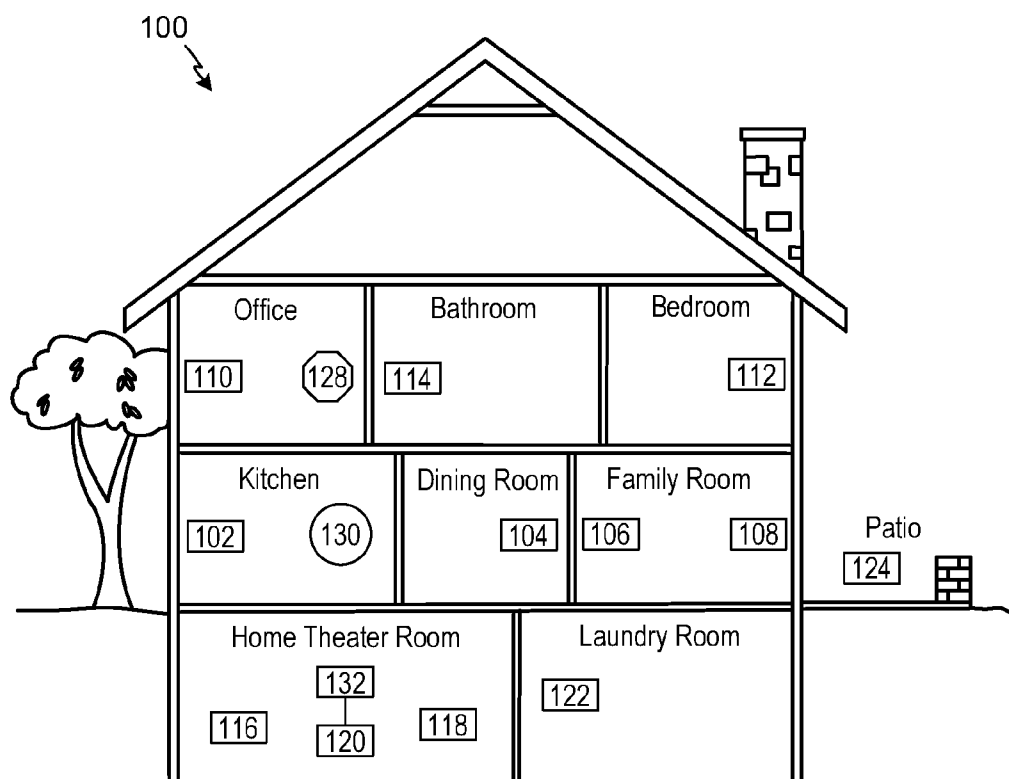


FIGURE 1

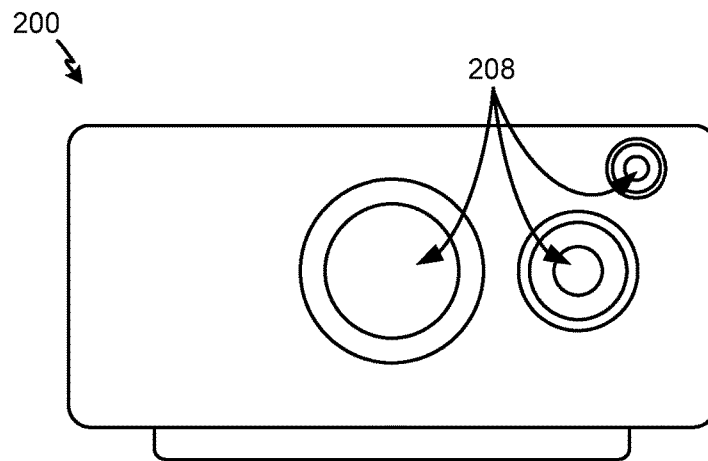


FIGURE 2A

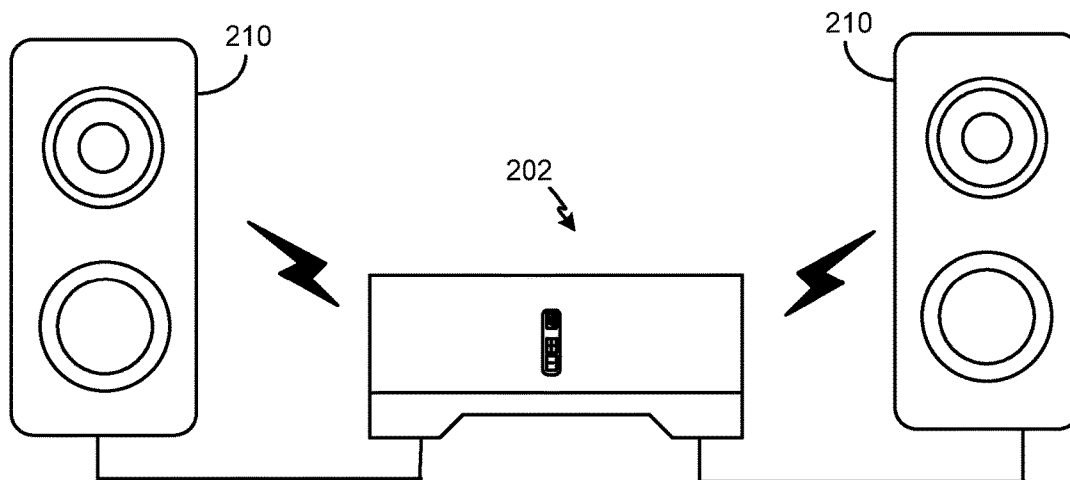


FIGURE 2B

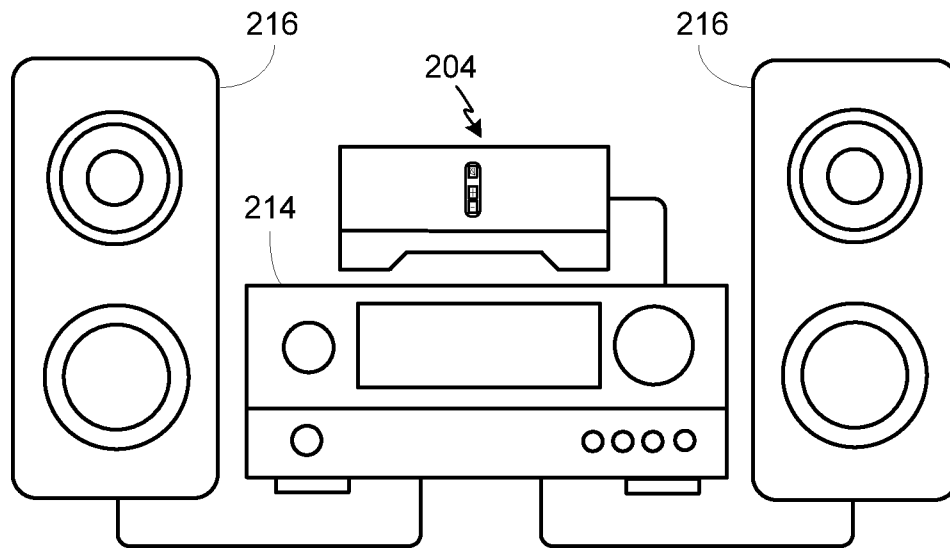


FIGURE 2C

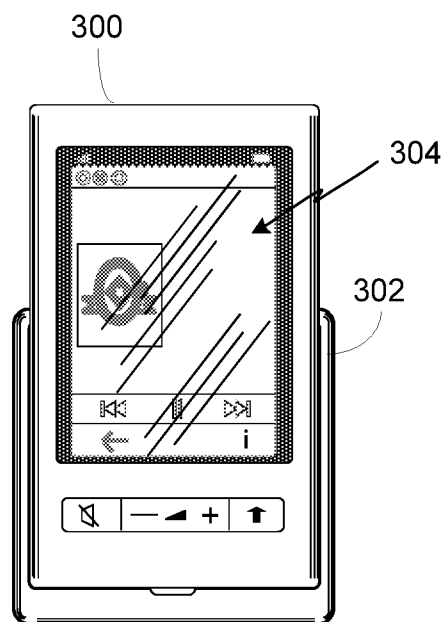


FIGURE 3

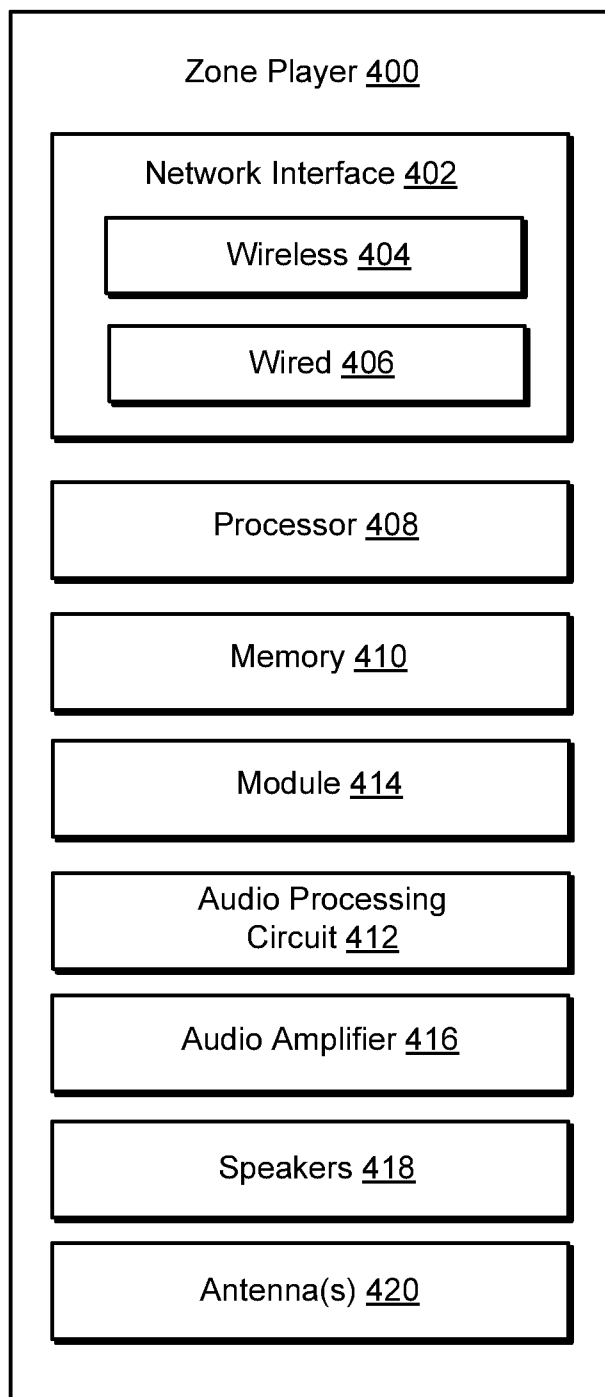


FIGURE 4

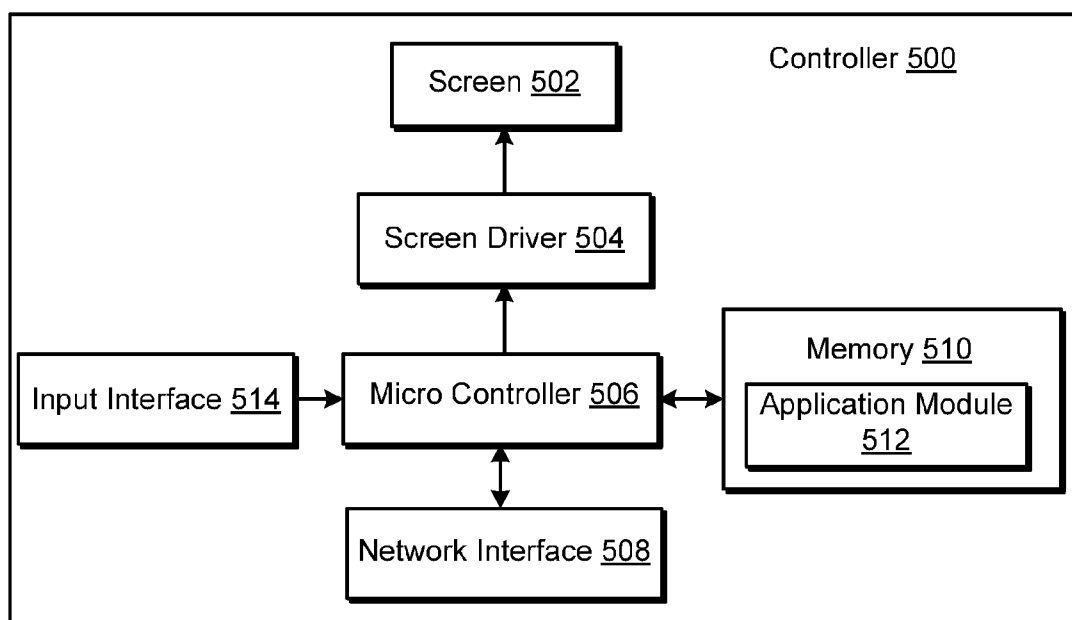


FIGURE 5

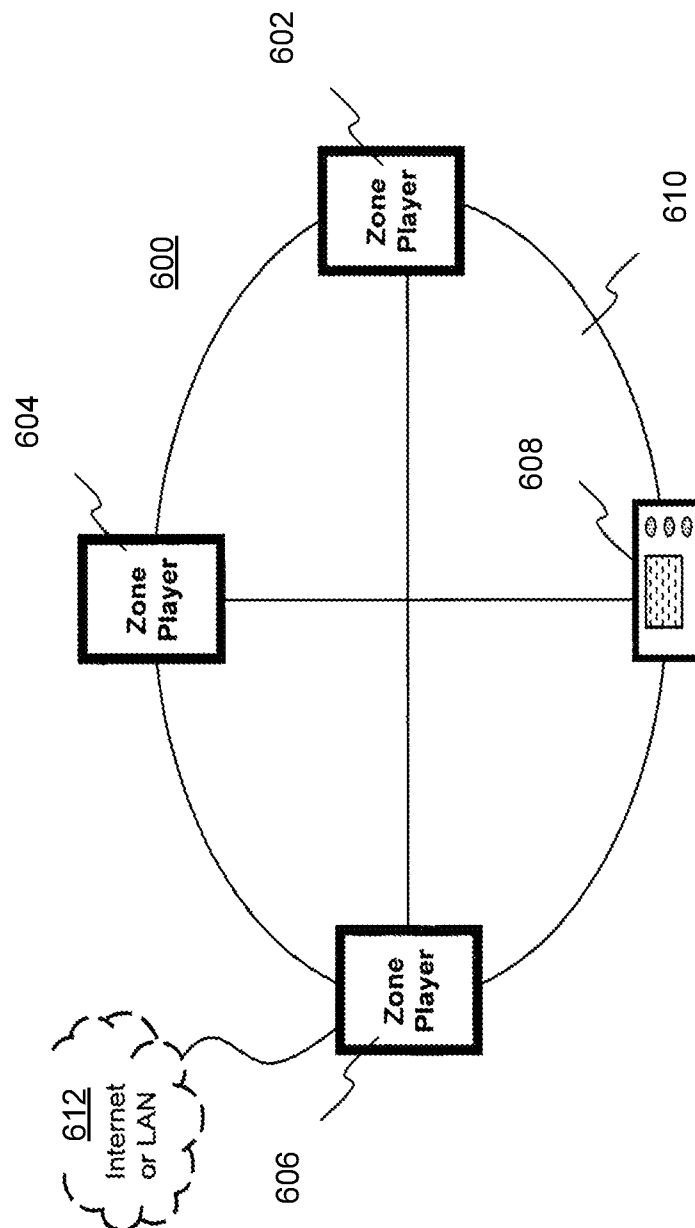


FIGURE 6

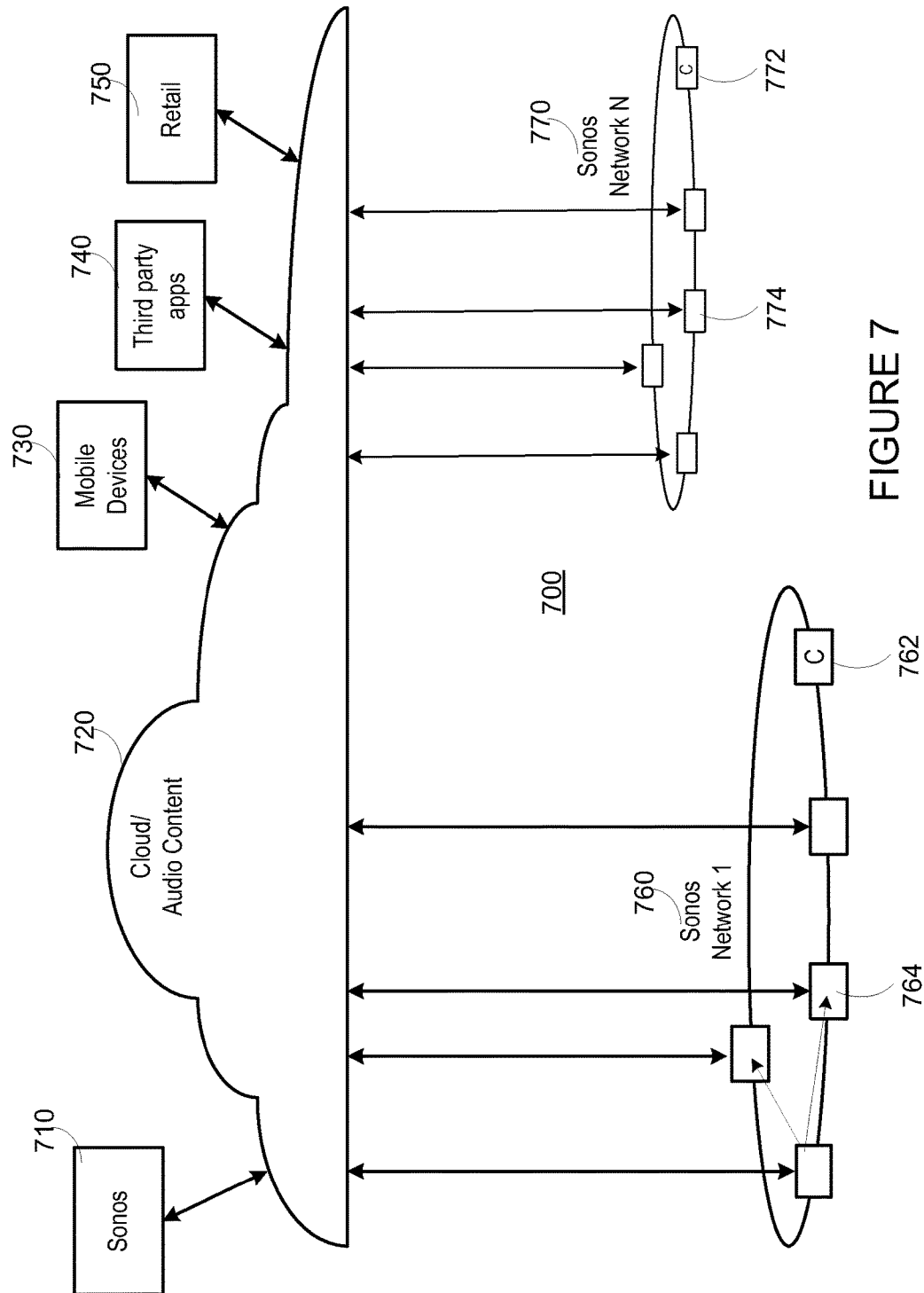


FIGURE 7

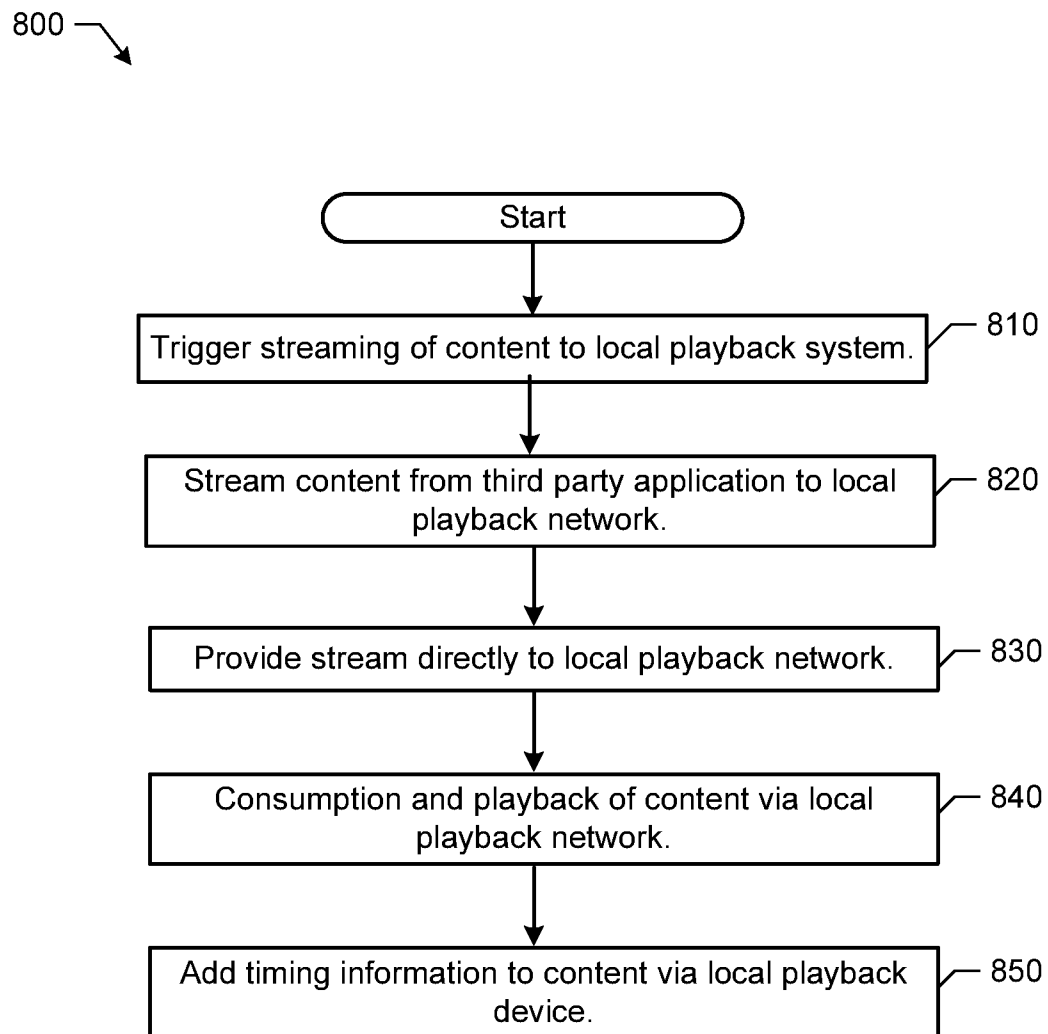


FIGURE 8

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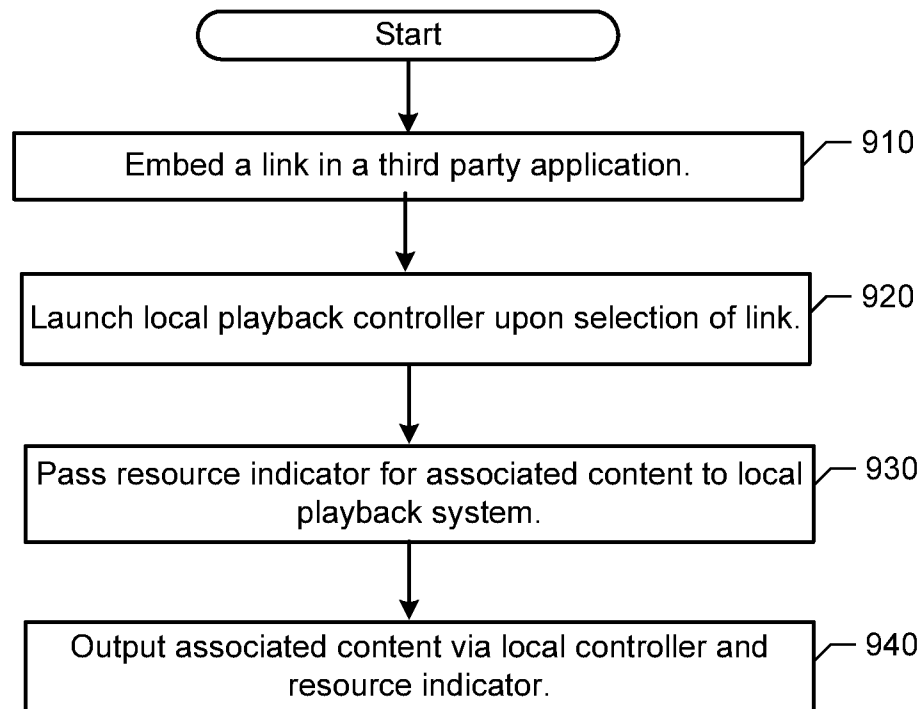


FIGURE 9

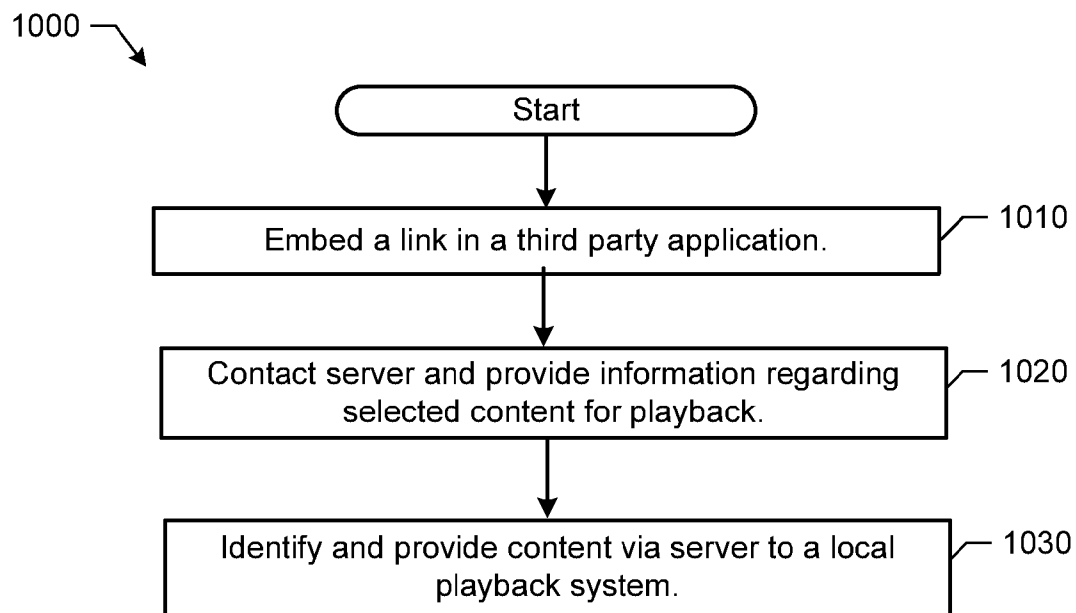


FIGURE 10

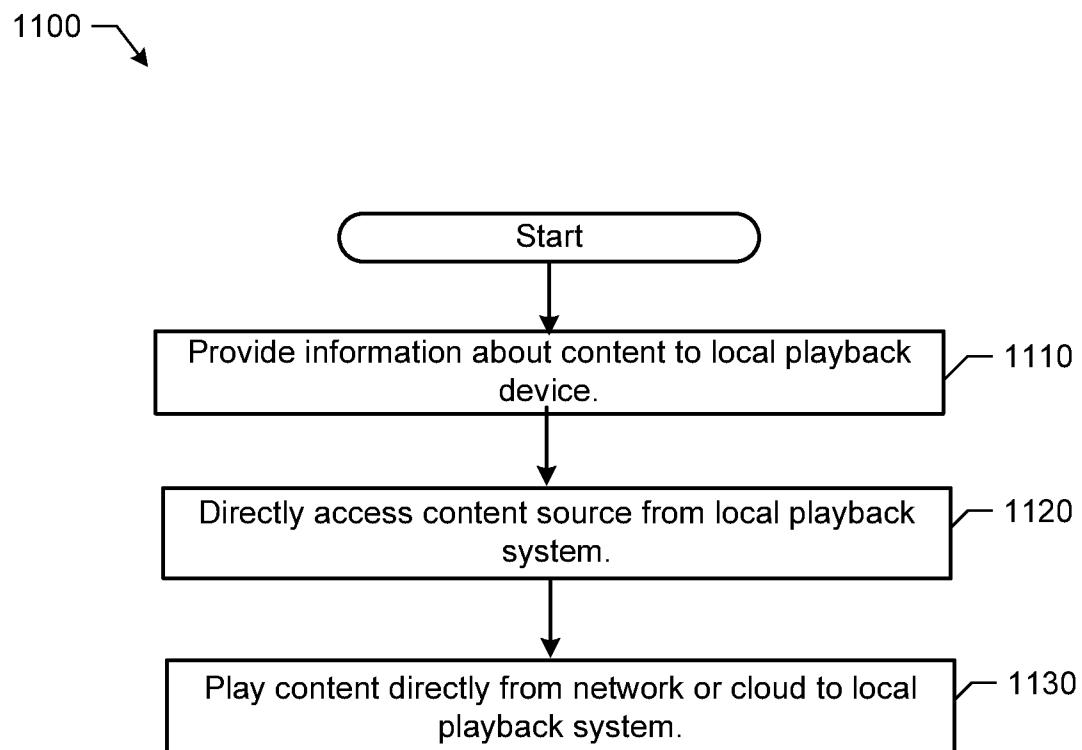


FIGURE 11

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NETWORKED MUSIC PLAYBACK**CROSS-REFERENCE TO RELATED APPLICATIONS**

The present application claims the benefit of priority to U.S. Non-Provisional application Ser. No. 13/341,237, filed on Dec. 30, 2011, entitled "Systems and Methods for Networked Music Playback", which is hereby incorporated by reference in its entirety for all purposes.

FIELD OF THE DISCLOSURE

The disclosure is related to consumer electronics and, more particularly, to providing music for playback via one or more devices on a playback data network.

BACKGROUND

Technological advancements have increased the accessibility of music content, as well as other types of media, such as television content, movies, and interactive content. For example, a user can access audio, video, or both audio and video content over the Internet through an online store, an Internet radio station, an online music service, an online movie service, and the like, in addition to the more traditional avenues of accessing audio and video content. Demand for such audio and video content continues to surge. Given the high demand, technology used to access and play such content has likewise improved.

BRIEF DESCRIPTION OF THE DRAWINGS

Features, aspects, and advantages of the presently disclosed technology are better understood with regard to the following description, appended claims, and accompanying drawings where:

FIG. 1 shows an illustration of an example system in which embodiments of the methods and apparatus disclosed herein can be implemented;

FIG. 2A shows an illustration of an example zone player having a built-in amplifier and speakers;

FIG. 2B shows an illustration of an example zone player having a built-in amplifier and connected to external speakers;

FIG. 2C shows an illustration of an example zone player connected to an A/V receiver and speakers;

FIG. 3 shows an illustration of an example controller;

FIG. 4 shows an internal functional block diagram of an example zone player;

FIG. 5 shows an internal functional block diagram of an example controller;

FIG. 6 shows an example ad-hoc playback network;

FIG. 7 shows a system including a plurality of networks including a cloud-based network and at least one local playback network; and

FIGS. 8-11 show flow diagrams for methods to provide audio content to a local playback system.

In addition, the drawings are for the purpose of illustrating example embodiments, but it is understood that the present disclosure is not limited to the arrangements and instrumentality shown in the drawings.

DETAILED DESCRIPTION**I. Overview**

Wired or wireless networks can be used to connect one or more multimedia playback devices for a home or other

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location playback network (e.g., a home music system). Certain examples provide automatic configuration of parameters of a playback device to be coupled to a network with reduced or minimum human intervention. For example, a wired and/or wireless ad-hoc network is established to facilitate communications among a group of devices. Music and/or other multimedia content can be shared among devices and/or groups of devices (also referred to herein as zones) associated with a playback network.

Certain embodiments facilitate streaming or otherwise providing music from a music-playing application (e.g., browser-based application, native music player, other multimedia application, and so on) to a multimedia content playback (e.g., Sonos™) system. Certain embodiments provide simple, easy-to-use and secure systems and methods for multimedia content playback across a plurality of systems and locations. Certain embodiments facilitate integration between content partners and a playback system as well as supporting maintenance of such content and system.

Although the following discloses example systems, methods, apparatus, and articles of manufacture including, among other components, firmware and/or software executed on hardware, it should be noted that such systems, methods, apparatus, and/or articles of manufacture are merely illustrative and should not be considered as limiting. For example, it is contemplated that any or all of these firmware, hardware, and/or software components could be embodied exclusively in hardware, exclusively in software, exclusively in firmware, or in any combination of hardware, software, and/or firmware. Accordingly, while the following describes example systems, methods, apparatus, and/or articles of manufacture, the examples provided are not the only way(s) to implement such systems, methods, apparatus, and/or articles of manufacture.

When any of the appended claims are read to cover a purely software and/or firmware implementation, at least one of the elements in at least one example is hereby expressly defined to include a tangible medium such as a memory, DVD, CD, Blu-ray, and so on, storing the software and/or firmware.

Reference herein to "embodiment" means that a particular feature, structure, or characteristic described in connection with the embodiment can be included in at least one example embodiment of the invention. The appearances of this phrase in various places in the specification are not necessarily all referring to the same embodiment, nor are separate or alternative embodiments mutually exclusive of other embodiments. As such, the embodiments described herein, explicitly and implicitly understood by one skilled in the art, can be combined with other embodiments.

Certain embodiments provide a method to provide content to a local playback network. The example method includes identifying multimedia content from a content provider. The example method includes passing information regarding the multimedia content to a local playback system including one or more multimedia playback devices in response to a trigger. The example method includes facilitating play of the multimedia content via a local playback network associated with the local playback system.

Certain embodiments provide a computer readable storage medium including instructions for execution by a processor, the instructions, when executed, cause the processor to implement a method to provide content to a local playback network. The example method includes identifying multimedia content from a content provider. The example method includes passing information regarding the multimedia content to a local playback system including one or

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more multimedia playback devices in response to a trigger. The example method includes facilitating play of the multimedia content via a local playback network associated with the local playback system.

Certain embodiments provide a multimedia playback device including a wireless communication interface to communicate with a local playback network and a multimedia content source and a processor. The process is to identify multimedia content from the multimedia content source; pass information regarding the multimedia content to device on the local playback network in response to a trigger; and facilitate play of the multimedia content via the devices on the local playback network.

II. Example Environment

Referring now to the drawings, in which like numerals can refer to like parts throughout the figures, FIG. 1 shows an example system configuration 100 in which one or more of the method and/or apparatus disclosed herein can be practiced or implemented. By way of illustration, the system configuration 100 represents a home with multiple zones. Each zone, for example, represents a different room or space, such as an office, bathroom, bedroom, kitchen, dining room, family room, home theater room, utility or laundry room, and patio. While not shown here, a single zone can cover more than one room or space. One or more of zone players 102-124 are shown in each respective zone. A zone player 102-124, also referred to as a playback device, multimedia unit, speaker, and so on, provides audio, video, and/or audiovisual output. A controller 130 (e.g., shown in the kitchen for purposes of illustration) provides control to the system configuration 100. The system configuration 100 illustrates an example whole house audio system, though it is understood that the technology described herein is not limited to its particular place of application or to an expansive system like a whole house audio system 100 of FIG. 1.

FIGS. 2A, 2B, and 2C show example illustrations of zone players 200-204. The zone players 200-204 of FIGS. 2A, 2B, and 2C, respectively, can correspond to any of the zone players 102-124 of FIG. 1. While certain embodiments provide multiple zone players, an audio output can be generated using only a single zone player. FIG. 2A illustrates a zone player 200 including sound producing equipment 208 capable of generating sound or an audio output corresponding to a signal received (e.g., wirelessly and/or via a wired interface). The sound producing equipment 208 of the zone player 200 of FIG. 2A includes a built-in amplifier (not shown in this illustration) and speakers (e.g., a tweeter, a mid-range driver, and/or a subwoofer). In certain embodiments, the zone player 200 of FIG. 2A can be configured to play stereophonic audio or monaural audio. In some embodiments, the zone player 200 of FIG. 2A can be configured as a component in a combination of zone players to play stereophonic audio, monaural audio, and/or surround audio. As described in greater detail below, in some embodiments, the example zone player 200 of FIG. 2A can also transmit a second signal to, for example, other zone player(s) in the same or different zone(s), speaker(s), receiver(s), and so on. Transmission of the second signal can be part of, for example, a system in which multiple zone players, speakers, receivers, and so on, form a network to, for example, present media content in a synchronization or distributed manner.

The example zone player 202 of FIG. 2B includes a built-in amplifier (not shown in this illustration) to power a set of detached speakers 210. The speakers 210 of FIG. 2B

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can include, for example, any type of loudspeaker. The zone player 202 of FIG. 2B can communicate a signal corresponding to audio content to the detached speakers 210 via wired and/or wireless channels. Instead of receiving and generating audio content as in FIG. 2A, the zone player 202 of FIG. 2B receives the audio content and transmits the same (e.g., after processing the received signal) to the detached speakers 210. Similar to the example zone player 200 of FIG. 2A, in some embodiments the zone player 202 can transmit a second signal to, for example, other zone player(s) in the same or different zone(s), speaker(s), receiver(s), and so on.

The example zone player 204 of FIG. 2C does not include an amplifier, but allows a receiver 214, or another audio and/or video type device with built-in amplification, to connect to a data network 128 of FIG. 1 and to play audio received over the data network 128 via the receiver 214 and a set of detached speakers 216. In addition to the wired couplings shown in FIG. 2C, the detached speakers 216 can receive audio content via a wireless communication channel between the detached speakers 216 and, for example, the zone player 204 and/or the receiver 214. In some embodiments the zone player 202 can transmit a second signal to, for example, other zone player(s) in the same or different zone(s), speaker(s), receiver(s), and so on.

Example zone players include a "Sonos S5," "Sonos Play:5," "Sonos Play:3," "ZonePlayer 120," and "ZonePlayer 90," which are offered by Sonos, Inc. of Santa Barbara, Calif. Any other past, present, and/or future zone players can additionally or alternatively be used to implement the zone players of example embodiments disclosed herein. A zone player can also be referred to herein as a playback device, and a zone player is not limited to the particular examples illustrated in FIGS. 2A, 2B, and 2C. For example, a zone player can include a wired or wireless headphone. In other examples, a zone player might include a subwoofer. In yet other examples, a zone player can include a sound bar. In an example, a zone player can include or interact with a docking station for an Apple iPod™ or similar device. In some embodiments, a zone player can relay one or more signals received from, for example, a first zone player to another playback device. In some embodiments, a zone player can receive a first signal and generate an output corresponding to the first signal and, simultaneously or separately, can receive a second signal and transmit or relay the second signal to another zone player(s), speaker(s), receiver(s), and so on. Thus, an example zone player described herein can act as a playback device and, at the same time, operate as a hub in a network of zone players. In such instances, media content corresponding to the first signal can be different from the media content corresponding to the second signal.

FIG. 3 shows an example illustration of a wireless controller 300 in a docking station 302. The controller 300 can correspond to the controlling device 130 of FIG. 1. The controller 300 is provided with a touch screen 304 that allows a user to interact with the controller 300, for example, to retrieve and navigate a playlist of audio items, control operations of one or more zone players, and provide overall control of the system configuration 100. In certain embodiments, any number of controllers can be used to control the system configuration 100. In certain embodiments, there can be a limit on the number of controllers that can control the system configuration 100. The controllers might be wireless like wireless controller 300 or wired to the data network 128. Furthermore, an application running on any network-enabled portable devices, such as an iPhone™ iPad™

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Android™ powered phone, or any other smart phone or network-enabled device can be used as a controller by connecting to the data network 128. An application running on a laptop or desktop PC or Mac can also be used as a controller. Example controllers include a “Sonos® Controller 200,” “Sonos® Controller for iPhone,” “Sonos® Controller for iPad,” “Sonos® Controller for Android,” “Sonos® Controller for Mac or PC,” which are offered by Sonos, Inc. of Santa Barbara, Calif. The flexibility of such an application and its ability to be ported to a new type of portable device is advantageous.

Referring back to the system configuration 100 of FIG. 1, a particular zone can contain one or more zone players. For example, the family room of FIG. 1 contains two zone players 106 and 108, while the kitchen is shown with one zone player 102. Zones can be dynamically configured by positioning a zone player in a room or space and assigning via the controller 130 the zone player to a new or existing zone. As such, zones can be created, combined with another zone, removed, and given a specific name (e.g., “Kitchen”), if so programmed. The zone players 102 to 124 are coupled directly or indirectly to a data network, such as the data network 128 shown in FIG. 1. The data network 128 is represented by an octagon in the figure to stand out from other components shown in the figure. While the data network 128 is shown in a single location, it is understood that such a network can be distributed in and around the system configuration 100.

Particularly, the data network 128 can be a wired network, a wireless network, or a combination of both. In some embodiments, one or more of the zone players 102-124 are wirelessly coupled to the data network 128 based on a proprietary mesh network. In some embodiments, one or more of the zone players 102-124 are wirelessly coupled to the data network 128 using a non-mesh topology. In some embodiments, one or more of the zone players 102-124 are coupled via a wire to the data network 128 using Ethernet or similar technology. In addition to the one or more zone players 102-124 connecting to the data network 128, the data network 128 can further allow access to a wide area network, such as the Internet.

In certain embodiments, the data network 128 can be created by connecting any of the zone players 102-124, or some other connecting device, to a broadband router. Other zone players 102-124 can then be added wired or wirelessly to the data network 128. For example, a zone player (e.g., any of zone players 102-124) can be added to the system configuration 100 by simply pressing a button on the zone player itself, which enables a connection to be made to the data network 128. The broadband router can be connected to an Internet Service Provider (ISP), for example. The broadband router can be used to form another data network within the system configuration 100, which can be used in other applications (e.g., web surfing). The data network 128 can also be used in other applications, if so programmed. Further, in certain embodiments, the data network 128 is the same network used for other applications in the household.

In certain embodiments, each zone can play from the same audio source as another zone or each zone can play from a different audio source. For example, someone can be grilling on the patio and listening to jazz music via zone player 124, while someone is preparing food in the kitchen and listening to classical music via zone player 102. Further, someone can be in the office listening to the same jazz music via zone player 110 that is playing on the patio via zone player 124. In some embodiments, the jazz music played via zone players 110 and 124 is played in synchrony. Synchrony-

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nizing playback amongst zones allows for someone to pass through zones while seamlessly listening to the audio. Further, zones can be put into a “party mode” such that all associated zones will play audio in synchrony.

In certain embodiments, a zone contains two or more zone players. For example, the family room contains two zone players 106 and 108, and the home theater room contains at least zone players 116, 118, and 120. A zone can be configured to contain as many zone players as desired, and for example, the home theater room might contain additional zone players to play audio from a 5.1 channel or greater audio source (e.g., a movie encoded with 5.1 or greater audio channels). If a zone contains two or more zone players, such as the two zone players 106 and 108 in the family room, then the two zone players 106 and 108 can be configured to play the same audio source in synchrony, or the two zone players 106 and 108 can be paired to play two separate sounds in left and right channels, for example. In other words, the stereo effects of a sound can be reproduced or enhanced through the two zone players 106 and 108, one for the left sound and the other for the right sound. In certain embodiments, paired zone players can play audio in synchrony with other zone players.

In certain embodiments, three or more zone players can be configured to play various channels of audio that is encoded with three channels or more sound. For example, the home theater room shows zone players 116, 118, and 120. If the sound is encoded as 2.1 channel audio, then the zone player 116 can be configured to play left channel audio, the zone player 118 can be configured to play right channel audio, and the zone player 120 can be configured to play bass frequencies. Other configurations are possible and depend on the number of zone players and the type of audio. Further, a particular zone can be configured to play a 5.1 channel audio in one instance, such as when playing audio from a movie, and then dynamically switch to play stereo, such as when playing audio from a two channel source.

In certain embodiments, two or more zone players can be sonically consolidated to form a single, consolidated zone player. A consolidated zone player (though made up of multiple, separate devices) can be configured to process and reproduce sound differently than an unconsolidated zone player or zone players that are paired, because a consolidated zone player will have additional speaker drivers from which sound can be passed. The consolidated zone player can further be paired with a single zone player or yet another consolidated zone player. Each playback device of a consolidated playback device is preferably set in a consolidated mode.

According to some embodiments, one can continue to do any of: group, consolidate, and pair zone players, for example, until a desired configuration is complete. The actions of grouping, consolidation, and pairing are preferably performed through a control interface, such as using controller 130, and not by physically connecting and reconnecting speaker wire, for example, to individual, discrete speakers to create different configurations. As such, certain embodiments described herein provide a more flexible and dynamic platform through which sound reproduction can be offered to the end-user.

Sources of audio content to be played by zone players 102-124 are numerous. Music from a personal library stored on a computer or networked-attached storage (NAS) can be accessed via the data network 128 and played. Internet radio stations, shows, and podcasts can be accessed via the data network 128. Music services that let a user stream and download music and audio content can be accessed via the

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data network 128. Further, music can be obtained from traditional sources, such as a turntable or CD player, via a line-in connection to a zone player, for example. Audio content can also be accessed through AirPlay™ wireless technology by Apple, Inc., for example. Audio content received from one or more sources can be shared amongst the zone players 102 to 124 via the data network 128 and/or the controller 130. The above-disclosed sources of audio content are referred to herein as network-based audio information sources. However, network-based audio information sources are not limited thereto.

The example home theater zone players 116, 118, 120 are coupled to an audio information source such as a television 132. In some examples, the television 132 is used as a source of audio for the home theater zone players 116, 118, 120, while in other examples audio information from the television 132 can be shared with any of the zone players 102-124 in the audio system 100.

III. Example Playback Device

Referring now to FIG. 4, there is shown an example functional block diagram of a zone player 400 in accordance with an embodiment. The zone player 400 of FIG. 4 includes a network interface 402, a processor 408, a memory 410, an audio processing component 412, a module 414, an audio amplifier 416, and a speaker unit 418 coupled to the audio amplifier 416. FIG. 2A shows an example illustration of such a zone player. Other types of zone players can not include the speaker unit 418 (e.g., such as shown in FIG. 2B) or the audio amplifier 416 (e.g., such as shown in FIG. 2C). Further, it is contemplated that the zone player 400 can be integrated into another component. For example, the zone player 400 could be constructed as part of a lamp for indoor or outdoor use.

Referring back to FIG. 4, the network interface 402 facilitates a data flow between zone players and other devices on a data network (e.g., the data network 128 of FIG. 1) and the zone player 400. In some embodiments, the network interface 402 can manage the assembling of an audio source or file into smaller packets that are to be transmitted over the data network or reassembles received packets into the original source or file. In some embodiments, the network interface 402 can further handle the address part of each packet so that it gets to the right destination or intercepts packets destined for the zone player 400. Accordingly, in certain embodiments, each of the packets includes an Internet Protocol (IP)-based source address as well as an IP-based destination address.

In some embodiments, the network interface 402 can include one or both of a wireless interface 404 and a wired interface 406. The wireless interface 404, also referred to as an RF interface, provides network interface functions for the zone player 400 to wirelessly communicate with other devices (e.g., other zone player(s), speaker(s), receiver(s), component(s) associated with the data network 128, and so on) in accordance with a communication protocol (e.g., any of the wireless standards IEEE 802.11a, 802.11b, 802.11g, 802.11n, or 802.15). To receive wireless signals and to provide the wireless signals to the wireless interface 404 and to transmit wireless signals, the zone player 400 of FIG. 4 includes one or more antennas 420. The wired interface 406 provides network interface functions for the zone player 400 to communicate over a wire with other devices in accordance with a communication protocol (e.g., IEEE 802.3). In some embodiments, a zone player includes both of the

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interfaces 404 and 406. In some embodiments, a zone player 400 includes only the wireless interface 404 or the wired interface 406.

In some embodiments, the processor 408 is a clock-driven electronic device that is configured to process input data according to instructions stored in memory 410. The memory 410 is data storage that can be loaded with one or more software modules 414, which can be executed by the processor 408 to achieve certain tasks. In the illustrated embodiment, the memory 410 is a tangible machine readable medium storing instructions that can be executed by the processor 408. In some embodiments, a task might be for the zone player 400 to retrieve audio data from another zone player or a device on a network. In some embodiments, a task might be for the zone player 400 to send audio data to another zone player or device on a network. In some embodiments, a task might be for the zone player 400 to synchronize playback of audio with one or more additional zone players. In some embodiments, a task might be to pair the zone player 400 with one or more zone players to create a multi-channel audio environment. Additional or alternative tasks can be achieved via the one or more software modules 414 and the processor 408.

The audio processing component 412 can include one or more digital-to-analog converters (DAC), an audio preprocessing component, an audio enhancement component or a digital signal processor, and so on. In certain embodiments, the audio that is retrieved via the network interface 402 is processed and/or intentionally altered by the audio processing component 412. Further, the audio processing component 412 can produce analog audio signals. The processed analog audio signals are then provided to the audio amplifier 416 for play back through speakers 418. In addition, the audio processing component 412 can include necessary circuitry to process analog or digital signals as inputs to play from zone player 400, send to another zone player on a network, or both play and send to another zone player on the network. An example input includes a line-in connection (e.g., an auto-detecting 3.5 mm audio line-in connection). The audio amplifier 416 is a device that amplifies audio signals to a level for driving one or more speakers 418. The one or more speakers 418 can include an individual transducer (e.g., a “driver”) or a complete speaker system that includes an enclosure including one or more drivers. A particular driver can be a subwoofer (for low frequencies), a mid-range driver (middle frequencies), and a tweeter (high frequencies), for example. An enclosure can be sealed or ported, for example.

A zone player 400 can also be referred to herein as a playback device. An example playback device includes a Sonos® Play:5, which is manufactured by Sonos, Inc. of Santa Barbara, Calif. The Play:5 is an example zone player with a built-in amplifier and speakers. In particular, the Play:5 is a five-driver speaker system that includes two tweeters, two mid-range drivers, and one subwoofer. When playing audio content via the Play:5, the left audio data of a track is sent out of the left tweeter and left mid-range driver, the right audio data of a track is sent out of the right tweeter and the right mid-range driver, and mono bass is sent out of the subwoofer. Further, both mid-range drivers and both tweeters have the same equalization (or substantially the same equalization). That is, they are both sent the same frequencies, just from different channels of audio. Audio from Internet radio stations, online music and video services, downloaded music, analog audio inputs, television, DVD, and so on, can be played from a Sonos® Play:5. While the Play:5 is an example of a zone player with

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speakers, it is understood that a zone player with speakers is not limited to one with a certain number of speakers (e.g., five speakers as in the Play:5), but rather can contain one or more speakers. Further, a zone player can be part of another device, which might even serve a purpose different than audio (e.g., a lamp).

IV. Example Controller

Referring now to FIG. 5, there is shown an example controller 500, which can correspond to the controlling device 130 in FIG. 1. The controller 500 can be used to facilitate the control of multi-media applications, automation and others in a system. In particular, the controller 500 is configured to facilitate a selection of a plurality of audio sources available on the network and enable control of one or more zone players (e.g., the zone players 102-124 in FIG. 1) through a wireless network interface 508. According to one embodiment, the wireless communications is based on an industry standard (e.g., infrared, radio, wireless standards IEEE 802.11a, 802.11b, 802.11g, 802.11n, or 802.15). Further, when a particular audio is being accessed via the controller 500 or being played via a zone player, a picture (e.g., album art) or any other data, associated with the audio source can be transmitted from a zone player or other electronic device to the controller 500 for display.

The controller 500 is provided with a screen 502 and an input interface 514 that allows a user to interact with the controller 500, for example, to navigate a playlist of many multimedia items and to control operations of one or more zone players. The screen 502 on the controller 500 can be an LCD screen, for example. The screen 500 communicates with and is commanded by a screen driver 504 that is controlled by a microcontroller (e.g., a processor) 506. The memory 510 can be loaded with one or more application modules 512 that can be executed by the microcontroller 506 with or without a user input via the user interface 514 to achieve certain tasks. In some embodiments, an application module 512 is configured to facilitate grouping a number of selected zone players into a zone group and synchronizing the zone players for audio play back. In some embodiments, an application module 512 is configured to control the audio sounds (e.g., volume) of the zone players in a zone group. In operation, when the microcontroller 506 executes one or more of the application modules 512, the screen driver 504 generates control signals to drive the screen 502 to display an application specific user interface accordingly.

The controller 500 includes a network interface 508 that facilitates wireless communication with a zone player. In some embodiments, the commands such as volume control and audio playback synchronization are sent via the network interface 508. In some embodiments, a saved zone group configuration is transmitted between a zone player and a controller via the network interface 508. The controller 500 can control one or more zone players, such as 102-124 of FIG. 1. There can be more than one controller for a particular system. Further, a controller can be integrated into a zone player.

It should be noted that other network-enabled devices such as an iPhone®, iPad® or any other smart phone or network-enabled device (e.g., a networked computer such as a PC or Mac®) can also be used as a controller to interact or control zone players in a particular environment. In some embodiments, a software application or upgrade can be downloaded onto a network enabled device to perform the functions described herein.

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In certain embodiments, a user can create a zone group including at least two zone players from the controller 500. The zone players in the zone group can play audio in a synchronized fashion, such that all of the zone players in the zone group play back an identical audio source or a list of identical audio sources in a synchronized manner such that no (or substantially no) audible delays or hiccups could be heard. Similarly, in some embodiments, when a user increases the audio volume of the group from the controller 500, the signals or data of increasing the audio volume for the group are sent to one of the zone players and causes other zone players in the group to be increased together in volume.

A user via the controller 500 can group zone players into a zone group by activating a "Link Zones" or "Add Zone" soft button, or de-grouping a zone group by activating an "Unlink Zones" or "Drop Zone" button. For example, one mechanism for 'joining' zone players together for audio play back is to link a number of zone players together to form a group. To link a number of zone players together, a user can manually link each zone player or room one after the other. For example, assume that there is a multi-zone system that includes the following zones: Bathroom, Bedroom, Den, Dining Room, Family Room, and Foyer.

In certain embodiments, a user can link any number of the six zone players, for example, by starting with a single zone and then manually linking each zone to that zone.

In certain embodiments, a set of zones can be dynamically linked together using a command to create a zone scene or theme (subsequent to first creating the zone scene). For instance, a "Morning" zone scene command can link the Bedroom, Office, and Kitchen zones together in one action. Without this single command, the user would need to manually and individually link each zone. The single command might include a mouse click, a double mouse click, a button press, a gesture, or some other programmed action. Other kinds of zone scenes can be programmed.

In certain embodiments, a zone scene can be triggered based on time (e.g., an alarm clock function). For instance, a zone scene can be set to apply at 8:00 am. The system can link appropriate zones automatically, set specific music to play, and then stop the music after a defined duration. Although any particular zone can be triggered to an "On" or "Off" state based on time, for example, a zone scene enables any zone(s) linked to the scene to play a predefined audio (e.g., a favorable song, a predefined playlist) at a specific time and/or for a specific duration. If, for any reason, the scheduled music failed to be played (e.g., an empty playlist, no connection to a share, failed Universal Plug and Play (UPnP), no Internet connection for an Internet Radio station, and so on), a backup buzzer can be programmed to sound. The buzzer can include a sound file that is stored in a zone player, for example.

V. Example Ad-Hoc Network

Certain particular examples will now be provided in connection with FIGS. 6-8B to describe, for purposes of illustration only, certain base systems and methods to provide and facilitate connection to a playback network. FIG. 6 shows that there are three zone players 602, 604 and 606 and a controller 608 that form a network branch that is also referred to as an Ad-Hoc network 610. The network 610 may be wireless, wired, or a combination of wired and wireless. In general, an Ad-Hoc (or "spontaneous") network is a local area network or other small network in which there is no one access point for all traffic. With an established Ad-Hoc network 610, the devices 602, 604, 606 and 608 can all

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communicate with each other in a “peer-to-peer” style of communication, for example. Furthermore, devices may come/and go from the network **610**, and the network **610** will automatically reconfigure itself without needing the user to reconfigure the network **610**.

Using the Ad-Hoc network **610**, the devices **602**, **604**, **606**, and **608** can share or exchange one or more audio sources and be grouped to play the same or different audio sources. For example, the devices **602** and **604** are grouped to playback one piece of music, and at the same time, the device **606** plays back another piece of music. In other words, the devices **602**, **604**, **606** and **608**, as shown in FIG. **6**, form a HOUSEHOLD that distributes audio and/or reproduces sound. As used herein, the term HOUSEHOLD (provided in uppercase letters to disambiguate from the user’s domicile) is used to represent a collection of networked devices that are cooperating to provide an application or service. An instance of a HOUSEHOLD is identified with a household **10** (or household identifier).

In certain embodiments, a household identifier (HHID) is a short string or an identifier that is computer-generated to help ensure that it is unique. Accordingly, the network **610** can be characterized by a unique HHID and a unique set of configuration variables or parameters, such as channels (e.g., respective frequency bands), SSID (a sequence of alphanumeric characters as a name of a wireless network), and WEP keys (wired equivalent privacy or other security keys). In certain embodiments, SSID is set to be the same as HHID.

In certain embodiments, each HOUSEHOLD includes two types of network nodes: a control point (CP) and a zone player (ZP). The control point controls an overall network setup process and sequencing, including an automatic generation of required network parameters (e.g., WEP keys). In an embodiment, the CP also provides the user with a HOUSEHOLD configuration user interface. The CP function can be provided by a computer running a CP application module, or by a handheld controller (e.g., the controller **308**) also running a CP application module, for example. The zone player is any other device on the network that is placed to participate in the automatic configuration process. The ZP, as a notation used herein, includes the controller **308** or a computing device, for example.

In certain embodiments, configuration of a HOUSEHOLD involves multiple CPs and ZPs that rendezvous and establish a known configuration such that they can use a standard networking protocol (e.g., IP over Wired or Wireless Ethernet) for communication. In an embodiment, two types of networks/protocols are employed: Ethernet 802.3 and Wireless 802.11g. Interconnections between a CP and a ZP can use either of the networks/protocols. A device in the system as a member of a HOUSEHOLD can connect to both networks simultaneously. In an environment that has both networks in use, it is assumed that at least one device in a system is connected to both as a bridging device, thus providing bridging services between wired/wireless networks for others. The zone player **606** in FIG. **6** is shown to be connected to both networks, for example. The connectivity to the network **612** is based on Ethernet while the connectivity to other devices **602**, **604** and **608** is based on Wireless. It is understood, however, that in some embodiments each zone player **606**, **604**, **602** may access the Internet when retrieving media from the cloud (e.g., Internet) via the bridging device. For example, zone player **602** may contain a uniform resource locator (URL) that specifies an address to a particular audio track in the cloud. Using the

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URL, the zone player **602** may retrieve the audio track from the cloud, and ultimately play the audio out of one or more zone players.

VI. Example Music Sharing and Playback Configuration

Certain embodiments enable a user to stream music from a music-playing application (e.g., browser-based application, native music player, other multimedia application, and so on) to a local multimedia content playback (e.g., Sonos™) system. Certain embodiments provide secure systems and methods for multimedia content playback across a plurality of systems and locations. Certain embodiments facilitate integration between content partners and a playback system as well as supporting maintenance of such content and system.

FIG. **7** shows a system including a plurality of networks including a cloud-based network and at least one local playback network. The network includes a plurality of playback devices or players, though it is understood that the network may contain only one playback device. In certain embodiments, each player has an ability to retrieve its content for playback. Control and content retrieval can be distributed or centralized, for example. Input can include streaming content provider input, third party application input, mobile device input, user input, and/or other playback network input into the cloud for local distribution and playback.

As illustrated by the example system **700** of FIG. **7**, a plurality of content providers **720-750** can be connected to one or more local playback networks **760-770** via a cloud and/or other network **710**. Using the cloud **710**, a multimedia playback system **720** (e.g., Sonos™), a mobile device **730**, a third party application **740**, a retail location **750**, and so on can provide multimedia content (requested or otherwise) to local playback networks **760**, **770**. Within each local network **760**, **770**, a controller **762**, **772** and/or playback device **764**, **774** can provide a song identifier, song name, playlist identifier, playlist name, genre, preference, and so on, and/or simply receive content from a connected system via the cloud.

For example, a user listens to a third party music application (e.g., Pandora™ Rhapsody™, Spotify™, and so on) on her smart phone while commuting. She’s enjoying the current channel and, as she walks in the door to her home, selects an option to continue playing that channel on her household music playback system (e.g., Sonos™). The playback system picks up from the same spot on the selected channel that was on her phone and outputs that content (e.g., that song) on speakers and/or other playback devices connected to the household playback system. A uniform resource indicator (URI) (e.g., a uniform resource locator (URL)) can be passed to a playback device to fetch content from a cloud and/or other networked source, for example. A playback device, such as a zone player, can fetch content on its own without use of a controller, for example. Once the zone player has a URL (or some other identification or address) for a song and/or playlist, the zone player can run on its own to fetch the content. Songs and/or other multimedia content can be retrieved from the Internet rather than a local device (e.g., a compact disc (CD)), for example. A third party application can open or utilize an application programming interface (API) to pass music to the household playback system without tight coupling to that household playback system.

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In another example of an application determining a playlist and/or other content for playback, a user enjoys listening to music on an online music service (e.g., turntable.fm or other virtual room that a user can enter to choose from a plurality of online disc jockeys (DJs) deciding what to play next) using his Mac Book Pro™ at home. He likes the unique user experience the service offers, and he frequently hops from room to room discovering new music. To maximize sound quality, he plays the music on his household playback system (e.g., Sonos™). A button or other indicator can be added to the turntable.fm Web application to switch the content being played to the playback system for output (e.g., to the Sonos™ system rather than or in addition to the Mac Book™). While Web-based applications typically do not have access to items on a local network, certain embodiments enable a third-party Web-based application (e.g., Turntable.fm) to talk to a playback system (e.g., Sonos™) in a certain way (e.g., may have to log in with a username and password), and the identified user has the website send audio or audio and video down to a playback device (e.g., a zone player) on the playback system local network to play music there (or some other media).

In another example, a first user creates a playlist (e.g., a Spotify™ playlist). The first user visits a second user's house, pulls out her smart phone and shares her playlist by playing it on the second user's household playback (e.g., Sonos™) system using her third party (e.g., Spotify™) application. The first user may also go to the third party content provider's (e.g., Spotify's™) website and share her playlist on the second user's playback system.

Thus, certain embodiments provide cross-service linking such that a song identifier can be passed from one user and/or service to another to be fetched and played. A user having a playlist on his or her phone can visit a friend and, using her account on her friend's system, play a song to which she has an access right. A retrieved song can be streamed locally to a user's phone, or an application can pass a song identifier to a local playback system which looks up the song identifier and finds an available audio stream to which the user has a right to play and then plays that song.

In another example, a user is staying in a hotel room or other facility including a local playback network. For example, a speaker and/or other playback device (e.g., a Sonos™ Play:3, Play: 5 and so on) in a hotel room can be utilized to play multimedia content to which the user has access from his or her playback network account, streaming audio source, third party application, and so on. Content can be output to one or more devices based on availability, access, configuration, priority, preference, and so on. In certain embodiments, a playback network includes a plurality of nodes, and each node has a capability to play sound in response to an input. Requested output is provided to a most logical connection, for example.

In certain embodiments, a phone device, a television device, and so on can be used to play music, audio, video and/or other multimedia content. In an example, a push button on a microphone or household intercom system to tell the kids dinner is ready is provided over the local playback network.

FIG. 8 shows a flow diagram for a method 800 to provide audio content to a local playback system. In the example method 800 of FIG. 8, a third party application acts as a "virtual line-in" to the local playback system. At block 810, streaming of music or other content from a third party application to a local content playback system is triggered. For example, a "Play to Sonos" button is pressed on a Rhapsody™ application. At block 820, content is streamed

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to one or more components in a household playback network. The music may be streamed to predetermined zones or players in a household, for example. The music may be further directed to be played in different zones or players throughout the household. Playback on the local network can be facilitated to one or more zones/players based on a configuration (e.g., a zone scene, theme, and so on). Thus, certain embodiments allow a large degree of flexibility in where the music is actually played. For example, the music can be played in the kitchen, the family room, the patio, and so on. Further, the music may be redirected to different zones.

At block 830, the incoming content (e.g., audio) stream is provided directly from a third party application or other external source to the local playback network for playback. For example, rather than passing track identifiers, an audio stream is provided to a Sonos household system for playback to one or more configured zones. At block 840, the local playback system consumes the stream and plays it as it would other content on the local playback (e.g., Sonos™) network (e.g., via zones and so on). At block 850, a playback device (e.g., a zone player, Play:3™, Play:5™, and so on) adds timing information to the streaming content signal (e.g., the device takes the streaming audio signal and repackages it for local synchronized playback). In some embodiments, timing information is not added to the signal unless two or more playback devices are configured to play the audio in synchrony.

FIG. 9 shows a flow diagram for a method 900 to provide audio content to a local playback system. In the example method 900 of FIG. 9, a uniform resource indicator (URI) handler approach is provided for content output. At block 910, a link or other reference is embedded in a third party application (e.g., Facebook™ or Twitter). At block 920, when the link is selected (e.g., clicked), a local playback (e.g., Sonos™) controller, if available, is launched. At block 930, the application (e.g., accessed on a phone, tablet, computer, and so on) passes a URI for associated content (e.g., an audio track and so on) to a local playback system (e.g., Sonos™) controller. At block 940, the local controller outputs the associated content (e.g., plays the music) via the URI. For example, music is streamed from the cloud to one or more playback devices on the local playback network.

In certain embodiments, an application associated with the operating system can register to handle all URIs (URLs) that start with a certain prefix and can define how data is encoded into those URLs so a local playback system application can generate a link (e.g., "sonos:") and put that link into a message (e.g., email, text message, instant message (IM), etc.). The local playback application registered to handle such URLs can parse the URLs to determine what song, playlist, streaming radio station, etc., to play. This launches the controller application. For example, if a first listener likes a song and tweets that song, Twitter™ can include a clickable link which launches a playback application and starts the music playing on a local playback system if the local system can find the song (e.g., if have the application, if have rights/access to the song, etc.). In certain embodiments, the system knows to trigger the receiving user's system rather than the sending user's system to play associated content based on the transmitted link/identifier.

For example, an application can register with the system to handle all URLs that start with a custom prefix (e.g., an HTTP "scheme"). For instance, Sonos controller apps can register to handle any URL that begins with "sonos:" or "x-sonos:". In certain embodiments, a playback system provider can define and publish the format of its URLs so

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that any third party application can create a link or reference to content. A large amount of data can be encoded into a URL using query parameters, for example.

In an example, when an application tries to “open” or “browse” to a URL, the system checks to see if the scheme of the URL matches the “sonos:” scheme that has been registered with the application. If a URL handler application is found, the system launches that application (e.g., the application can but does not need to be running in the background) and passes the URL to the application. The application then parses the URL and executes functionality based on the data in the URL. For example, the URL can contain the name of a music service and a playlist identifier from that service, plus the name of a Sonos™ Zone Player, causing the Sonos controller to start that playlist playing on that zone.

FIG. 10 shows a flow diagram for a method 1000 to provide audio content to a local playback system. In the example method 1000 of FIG. 10, at block 1010, a link or other reference is embedded in a third party application (e.g., Facebook™). At block 1020, when the link is selected, a playback system (e.g., Sonos™) server is contacted and provided with information regarding selected content for playback. For example, rather than launching a local controller application, a server is contacted regarding music for playback on a local network. At block 1030, using the provided information, the server identifies and provides the content locally on a user’s local playback system. For example, the server can then start playing the music directly on the user’s Sonos™ system (e.g., without going through a Sonos™ controller application).

In certain embodiments, a “single sign-on” technology is provided so that the user does not need to re-enter a username and password in order to authenticate to the playback server. Example single sign-on technologies include Facebook Connect™, Windows Live ID™, etc.

In certain embodiments, instead of using a specialized link, such as a “sonos:” link, a normal URL can be used to point to a playback system (e.g., Sonos™) webserver, which generates links with special data embedded in the link. A playback system is identified, and content identified by the URL can be playing at via the local playback network (e.g., mesh network configured for home, hotel room, etc.). Parameters such as authentication, security, location, and so on can be configured for local playback of remote content.

FIG. 11 shows a flow diagram for a method 1100 to provide audio content to a local playback system. The example method 1100 of FIG. 11 provides a “throw it over the wall” approach to content delivery to a local playback system. At block 1110, a third party application provides a multimedia playback device (e.g., a Sonos™ zone player (ZP)) with enough information about content (e.g., an audio track) so that, at block 1120, the local playback system (e.g., SonosNet™) can directly access a source of the content and, at block 1130, play the content directly off the network (e.g., the Internet) or cloud.

In certain embodiments, a local playback controller application is not involved. Information passed over to the local playback device may include an identifier for a single track, a playlist, a streaming radio station, a programmed radio station, and so on. This information can also include a current play position within a list to enable near-seamless “handoff” of music from a portable device to a local playback system. Once the music information is handed from the third-party application to the local playback system, there is no further synchronization between the two systems.

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A connection between the third-party application and the local playback device (e.g., Sonos ZonePlayer™) can be direct over a local area network (LAN), remote through a proxy server in the cloud, and so on. A LAN delivery approach may be easier to integrate into “native” applications (e.g., applications written for iOS or Android), and a proxy server approach may be easier for third party applications that are browser-based, for example.

In certain embodiments, information is provided from a third party application to a local playback system without being routed through or by a controller application. Here, the third party application is communicating with the multimedia playback device (e.g., a Sonos ZonePlayer™). Information can be passed locally, rather than through the Internet, for example. The local playback device accesses the Internet to find content to stream, and the third party application takes the place of the controller application (e.g., throw it over the wall—the application passes information and the local playback system runs it).

Certain embodiments provide an approach similar to the “throw it over the wall” or one way communication approach of FIG. 11 except that the third party application not only tells the local playback system what to play, but also maintains two-way communication with the local playback (e.g., Sonos™) system. Two-way communication helps enable features such as keeping a local playback queue synchronized with a queue that the user is editing/managing in the third party application; allow the third party application to know what is currently playing on the local playback system; allow integrated transport control between the third party application and the local playback system; and so on.

In certain embodiments, a local playback system can pass information back to a third party application to indicate a current point of playback (e.g., now playing a third song in a playlist, fourth song in the playlist, and so on). The local playback system can pass parameter information, such as a change in volume, from a local multimedia playback device to the third party application so the application can reflect the change in volume to the user via its graphical user interface. The third party application can instruct the local playback system to skip a song, go to a certain location, and so on.

Certain embodiments provide a third party mode that allows users to select from any local playback network (e.g., Sonos™) controller to listen to audio from one or more third party applications on their smartphones or tablets (e.g., Android™ devices). For example, a user may be using a local playback network controller application and now wants a third party application to appear as an audio source within the controller application. The user can then select the controller application that he or she wishes to play audio from the third party application, for example.

Certain embodiments provide queue management to allow a third party application to control a local playback queue. That is, the local playback system has a queue, but the third party application allows users to add, delete and so on from the queue, for example. Rather than switch from content that the user is currently playing, the local playback system allows a user to create a playlist on the fly. For example, if last.fm users vote that they do not like a song and it should be skipped, then the local playback system will skip it.

Certain embodiments allow a third party application to override a local playback queue with its own application-specific queue. The local playback system periodically fetches a short list of tracks to play next. The list of tracks to play is determined by the third-party application, for

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example. In certain embodiments, a shared queue is provided between the local playback system and the third party application to keep the local system and application synchronized.

Certain embodiments allow control of playback system functions and/or settings via an external (e.g., third party) application. For example, a local playback system can allow volume control, play/pause, and so on and can interact with an application running on a given platform/operating system (OS). Certain embodiments provide a Web API that can be used to access functionality.

Certain embodiments facilitate control of a local playback system from outside a household or other location at which the local playback network is configured. For example, a user can queue up music while away from his or her house. The application can facilitate setup and/or configuration. For example, a third party application may ask the user to enter a Sonos customer email address and password. The application can then make a request to a Sonos server in the cloud to determine the zone groups on which music can be played.

Various inventions have been described in sufficient detail with a certain degree of particularity. It is understood to those skilled in the art that the present disclosure of embodiments has been made by way of examples only and that numerous changes in the arrangement and combination of parts can be resorted without departing from the spirit and scope of the present disclosure as claimed. While the embodiments discussed herein can appear to include some limitations as to the presentation of the information units, in terms of the format and arrangement, the embodiments have applicability well beyond such embodiment, which can be appreciated by those skilled in the art. Accordingly, the scope of the present disclosure is defined by the appended claims rather than the foregoing description of embodiments.

The invention claimed is:

1. A method comprising:

causing, via a control device, a graphical interface to display a control interface including one or more transport controls to control playback by the control device; after connecting to a local area network via a network interface, identifying, via the control device, playback devices connected to the local area network;

causing, via the control device, the graphical interface to display a selectable option for transferring playback from the control device;

detecting, via the control device, a set of inputs to transfer playback from the control device to a particular playback device, wherein the set of inputs comprises: (i) a selection of the selectable option for transferring playback from the control device and (ii) a selection of the particular playback device from the identified playback devices connected to the local area network;

after detecting the set of inputs to transfer playback from the control device to the particular playback device, causing playback to be transferred from the control device to the particular playback device, wherein transferring playback from the control device to the particular playback device comprises:

(a) causing one or more first cloud servers to add multimedia content to a local playback queue on the particular playback device, wherein adding the multimedia content to the local playback queue comprises the one or more first cloud servers adding, to the local playback queue, one or more resource locators corresponding to respective locations of the multimedia content at one or more second cloud servers of a streaming content service;

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(b) causing playback at the control device to be stopped; and

(c) modifying the one or more transport controls of the control interface to control playback by the playback device; and

causing the particular playback device to play back the multimedia content, wherein the particular playback device playing back the multimedia content comprises the particular playback device retrieving the multimedia content from one or more second cloud servers of a streaming content service and playing back the retrieved multimedia content.

2. The method of claim 1, wherein detecting the set of inputs to transfer playback from the control device to the particular playback device comprises detecting a set of inputs to transfer playback from the control device to a particular zone of a media playback system that includes the particular playback device as a first channel of a stereo pair and an additional playback device as a second channel of the stereo pair, wherein modifying the one or more transport controls of the control interface to control playback by the particular playback device comprises causing the one or more transport controls of the control interface to control playback by the particular playback device and the additional playback device, and wherein the particular playback device playing back the retrieved multimedia content comprises the particular playback device and the additional playback device playing back the multimedia content as the stereo pair.

3. The method of claim 1, wherein detecting the set of inputs to transfer playback from the control device to the particular playback device comprises detecting a set of inputs to transfer playback from the control device to a particular zone group of a media particular playback system that includes a first zone and a second zone, wherein the first zone includes the particular playback device and the second zone includes at least one additional playback device, wherein modifying the one or more transport controls of the control interface to control playback by the playback device comprises causing the one or more transport controls of the control interface to control playback by the particular playback device and the at least one additional playback device in synchrony, and wherein the particular playback device playing back the retrieved multimedia content comprises the particular playback device and the at least one additional playback device playing back the multimedia content in synchrony.

4. The method of claim 1, wherein the control interface is displayed by an application associated with the streaming content service, and wherein the set of inputs further comprises detecting an input to select a link in the application associated with the streaming content service and wherein selection of the link launches a second application to facilitate retrieving the multimedia content by the particular playback device from a particular source indicated by a resource locator.

5. The method of claim 1, wherein the control interface is displayed by an application associated with the streaming content service, and wherein the set of inputs further comprises detecting an input to select a link in the application associated with the streaming content service and wherein selection of the link causes the control device to transmit information to the one or more first cloud servers to add multimedia content to the local playback queue on the particular playback device.

6. The method of claim 1, further comprising detecting, via the control device, a set of inputs to transfer playback

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from the playback device back to the control device, wherein transferring playback from the playback device back to the control device comprises:

causing playback at the playback device to be stopped; and

modifying the one or more transport controls of the control interface to control playback by the control device.

7. The method of claim 1, wherein causing the graphical interface to display the control interface including one or more transport controls to control playback by the control device comprises causing the graphical interface to display a control interface that includes the one or more transport controls in a particular arrangement on the graphical interface, and wherein modifying the one or more transport controls of the control interface to control playback by the particular playback device comprises causing the graphical interface to display the one or more transport controls to control playback by the particular playback device in the particular arrangement.

8. The method of claim 1, wherein causing the one or more first cloud servers to add multimedia content to the local playback queue comprises causing an identifier of the multimedia content to be added to the local playback queue, wherein the identifier indicates a particular source of the multimedia content at the one or more second cloud servers of the streaming content service, wherein the particular playback device receives the multimedia content from the particular source at the one or more second cloud servers of the streaming content service.

9. The method of claim 1, wherein causing one or more first cloud servers to add the multimedia content to the local playback queue on the particular playback device comprises sending a message to the streaming content service that causes the one or more first cloud servers to add the multimedia content to the local playback queue on the particular playback device.

10. The method of claim 1, wherein detecting the set of inputs comprises detecting a selection of the multimedia content.

11. The method of claim 1, wherein detecting the set of inputs comprises detecting an input that causes playback at the control device to be stopped.

12. The method of claim 1, wherein detecting the set of inputs comprises detecting selection of a button on the control interface.

13. A tangible, non-transitory computer readable storage medium including instructions for execution by a processor, the instructions, when executed, cause a control device to implement a method comprising:

causing a graphical interface to display a control interface including one or more transport controls to control playback by the control device;

after connecting to a local area network via a network interface, identifying playback devices connected to the local area network;

causing the graphical interface to display a selectable option for transferring playback from the control device;

detecting a set of inputs to transfer playback from the control device to a particular playback device, wherein the set of inputs comprises: (i) a selection of the selectable option for transferring playback from the control device and (ii) a selection of the particular playback device from the identified playback devices connected to the local area network;

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after detecting the set of inputs to transfer playback from the control device to the particular playback device, causing playback to be transferred from the control device to the particular playback device, wherein transferring playback from the control device to the particular playback device comprises:

(a) causing one or more first cloud servers to add multimedia content to a local playback queue on the particular playback device, wherein adding the multimedia content to the local playback queue comprises the one or more first cloud servers adding, to the local playback queue, one or more resource locators corresponding to respective locations of the multimedia content at one or more second cloud servers of a streaming content service;

(b) causing playback at the control device to be stopped; and

(c) modifying the one or more transport controls of the control interface to control playback by the playback device; and

causing the particular playback device to play back the multimedia content, wherein the particular playback device playing back the multimedia content comprises the particular playback device retrieving the multimedia content from one or more second cloud servers of a streaming content service and playing back the retrieved multimedia content.

14. The tangible, non-transitory computer readable medium of claim 13, wherein detecting the set of inputs to transfer playback from the control device to the particular playback device comprises detecting a set of inputs to transfer playback from the control device to a particular zone of a media playback system that includes the particular playback device as a first channel of a stereo pair and an additional playback device as a second channel of the stereo pair, wherein modifying the one or more transport controls of the control interface to control playback by the particular playback device comprises causing the one or more transport controls of the control interface to control playback by the particular playback device and the additional playback device, and wherein the particular playback device playing back the retrieved multimedia content comprises the particular playback device and the additional playback device playing back the multimedia content as the stereo pair.

15. The tangible, non-transitory computer readable medium of claim 13, wherein detecting the set of inputs to transfer playback from the control device to the particular playback device comprises detecting a set of inputs to transfer playback from the control device to a particular zone group of a media particular playback system that includes a first zone and a second zone, wherein the first zone includes the particular playback device and the second zone includes at least one additional playback device, wherein modifying the one or more transport controls of the control interface to control playback by the playback device comprises causing the one or more transport controls of the control interface to control playback by the particular playback device and the at least one additional playback device in synchrony, and wherein the particular playback device playing back the retrieved multimedia content comprises the particular playback device and the at least one additional playback device playing back the multimedia content in synchrony.

16. The tangible, non-transitory computer readable medium of claim 13, wherein the control interface is displayed by an application associated with the streaming content service, and wherein the set of inputs further com-

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prises detecting an input to select a link in the application associated with the streaming content service and wherein selection of the link launches a second application to facilitate retrieving the multimedia content by the particular playback device from a particular source indicated by a resource locator.

17. The tangible, non-transitory computer readable medium of claim 13, wherein the control interface is displayed by an application associated with the streaming content service, and wherein the set of inputs further comprises detecting an input to select a link in the application associated with the streaming content service and wherein selection of the link causes the control device to transmit information to the one or more first cloud servers to add multimedia content to the local playback queue on the particular playback device.

18. The tangible, non-transitory computer readable medium of claim 13, wherein the method further comprises detecting a set of inputs to transfer playback from the playback device back to the control device, wherein transferring playback from the playback device back to the control device comprises:

causing playback at the playback device to be stopped; and

modifying the one or more transport controls of the control interface to control playback by the control device.

19. The tangible, non-transitory computer readable medium of claim 13, wherein causing the graphical interface to display the control interface including one or more transport controls to control playback by the control device comprises causing the graphical interface to display a control interface that includes the one or more transport controls in a particular arrangement on the graphical interface, and wherein modifying the one or more transport controls of the control interface to control playback by the playback device comprises causing the graphical interface to display the one or more transport controls to control playback by the playback device in the particular arrangement.

20. The tangible, non-transitory computer readable medium of claim 13, wherein causing the one or more first cloud servers to add multimedia content to the local playback queue on the particular playback device comprises causing an identifier of the multimedia content to be added to the local playback queue, wherein the identifier indicates a particular source of the multimedia content at the one or more second cloud servers of the streaming content service, wherein the particular playback device receives the multimedia content from the particular source at the one or more second cloud servers of the streaming content service.

21. The tangible, non-transitory computer readable medium of claim 13, wherein causing one or more first cloud servers to add the multimedia content to the local playback queue on the particular playback device comprises sending a message to the streaming content service that causes the one or more first cloud servers to add the multimedia content to the local playback queue on the particular playback device.

22. The tangible, non-transitory computer readable medium of claim 13, wherein detecting the set of inputs comprises detecting a selection of the multimedia content.

23. The tangible, non-transitory computer readable medium of claim 13, wherein detecting the set of inputs comprises detecting an input that causes playback at the control device to be stopped.

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24. The tangible, non-transitory computer readable medium of claim 13, wherein detecting the set of inputs comprises detecting selection of a button on the control interface.

25. A control device comprising:

a graphical interface;

a wireless communication interface to communicate with a playback device;

one or more processors;

tangible non-transitory computer-readable media having instructions encoded therein, wherein the instructions, when executed by the one or more processors, cause the control device to perform functions comprising:

causing the graphical interface to display a control interface including one or more transport controls to control playback by the control device;

after connecting to a local area network via the wireless communication interface, identifying playback devices connected to the local area network;

causing the graphical interface to display a selectable option for transferring playback from the control device;

detecting a set of inputs to transfer playback from the control device to a particular playback device, wherein the set of inputs comprises: (i) a selection of the selectable option for transferring playback from the control device and (ii) a selection of the particular playback device from the identified playback devices connected to the local area network;

after detecting the set of inputs to transfer playback from the control device to the particular playback device, causing playback to be transferred from the control device to the particular playback device, wherein transferring playback from the control device to the particular playback device comprises:

(a) causing one or more first cloud servers to add multimedia content to a local playback queue on the particular playback device, wherein adding the multimedia content to the local playback queue comprises the one or more first cloud servers adding, to the local playback queue, one or more resource locators corresponding to respective locations of the multimedia content at one or more second cloud servers of a streaming content service;

(b) causing playback at the control device to be stopped; and

(c) modifying the one or more transport controls of the control interface to control playback by the playback device; and

causing the particular playback device to play back the multimedia content, wherein the particular playback device playing back the multimedia content comprises the particular playback device retrieving the multimedia content from one or more second cloud servers of a streaming content service and playing back the retrieved multimedia content.

26. The control device of claim 25, wherein detecting the set of inputs to transfer playback from the control device to the particular playback device comprises detecting a set of inputs to transfer playback from the control device to a particular zone group of a media particular playback system that includes a first zone and a second zone, wherein the first zone includes the particular playback device and the second zone includes at least one additional playback device, wherein modifying the one or more transport controls of the

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control interface to control playback by the playback device comprises causing the one or more transport controls of the control interface to control playback by the particular playback device and the at least one additional playback device in synchrony, and wherein the particular playback device 5 playing back the retrieved multimedia content comprises the particular playback device and the at least one additional playback device playing back the multimedia content in synchrony.

27. The control device of claim 25, wherein detecting the 10 set of inputs comprises detecting a selection of the multimedia content.

28. The control device of claim 25, wherein detecting the set of inputs comprises detecting an input that causes 15 playback at the control device to be stopped.

29. The control device of claim 25, wherein detecting the set of inputs comprises detecting selection of a button on the control interface.

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EXHIBIT 2

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(54) **SYSTEMS AND METHODS FOR
NETWORKED MUSIC PLAYBACK**

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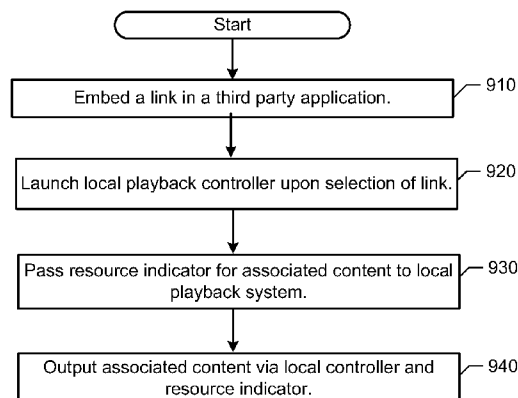
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(57) **ABSTRACT**

An example computing device in a first mode is configured for playback of given audio content. While in the first mode, the computing device displays a representation of one or more playback devices in a media playback system that are available to accept playback responsibility for the given audio content and receives user input indicating a selection of a given playback device. The computing device transmits an instruction for playback responsibility to be transferred to the given playback device such that i) an identifier of the given audio content and a playback position for the given audio content are provided to the given playback device and ii) the given playback device becomes configured for playback of the given audio content. The computing device transitions from the first mode to a second mode in which the computing device is configured to control the given playback device's playback of the given audio content.

16 Claims, 11 Drawing Sheets

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Related U.S. Application Data

continuation of application No. 14/520,578, filed on Oct. 22, 2014, now Pat. No. 9,883,234, which is a continuation of application No. 13/341,237, filed on Dec. 30, 2011, now Pat. No. 9,654,821.

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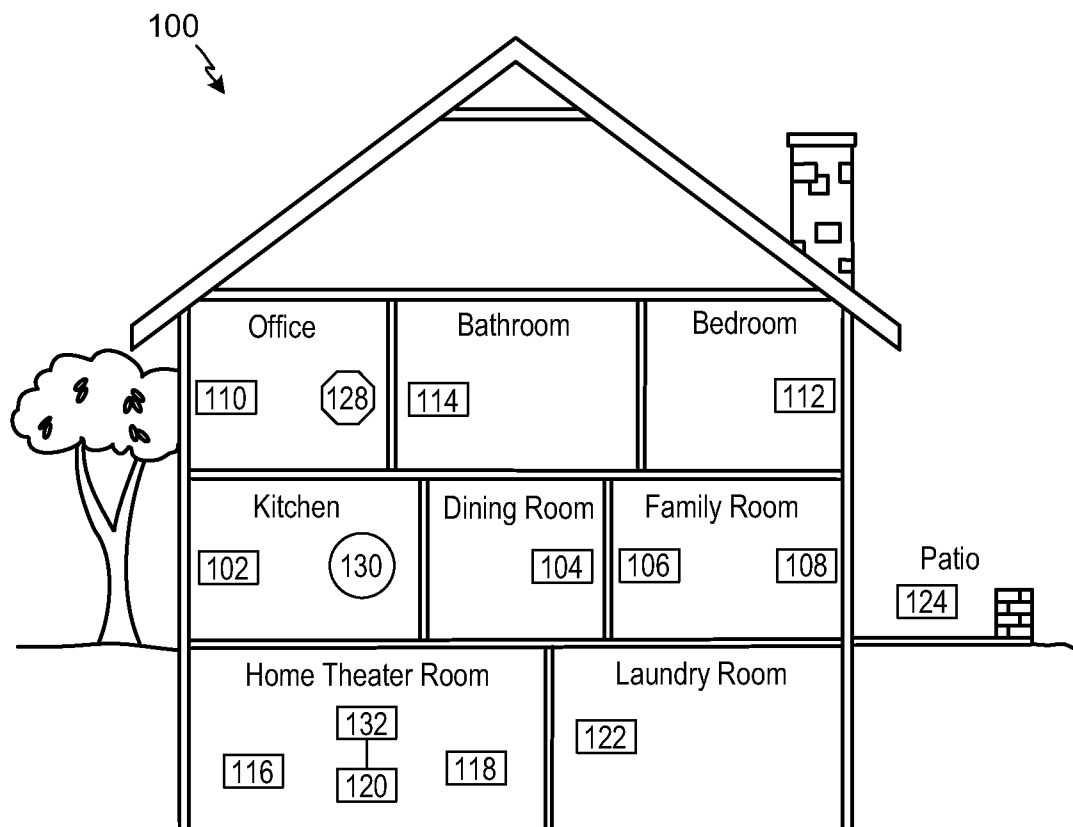


FIGURE 1

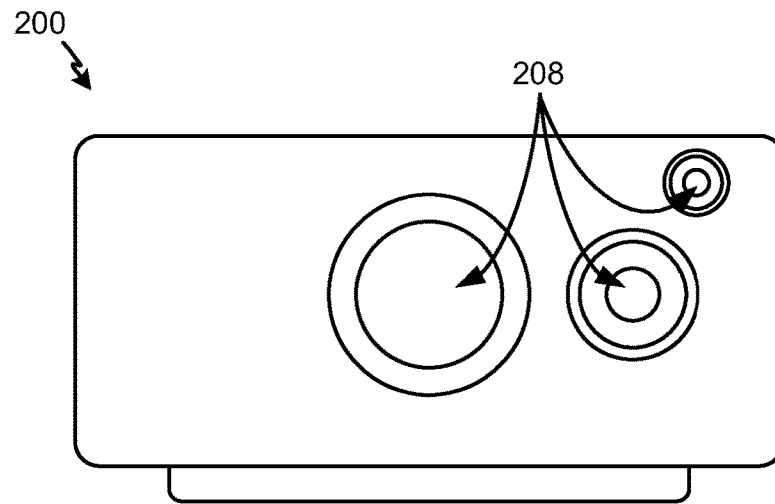


FIGURE 2A

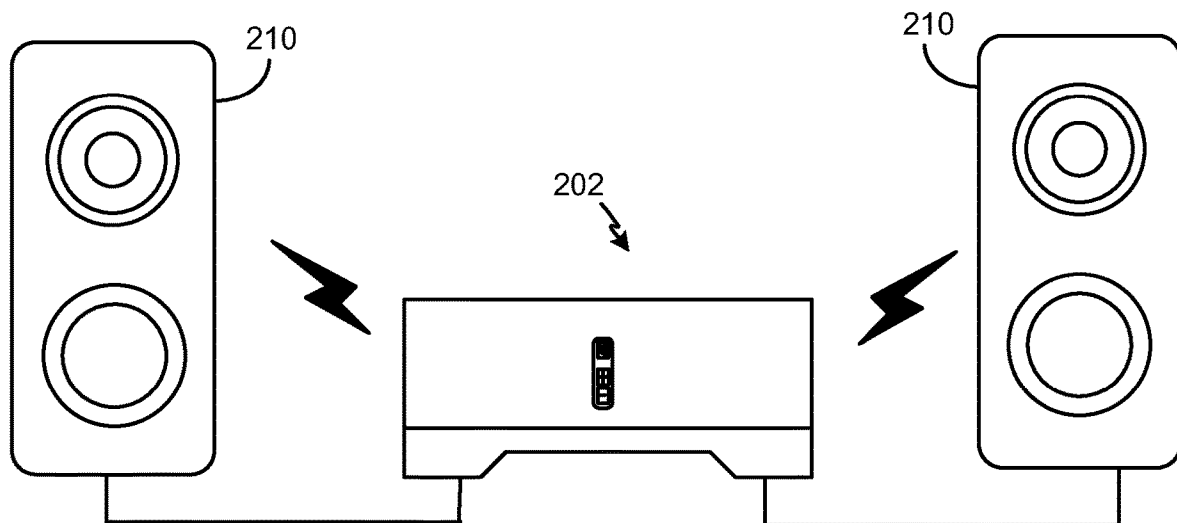


FIGURE 2B

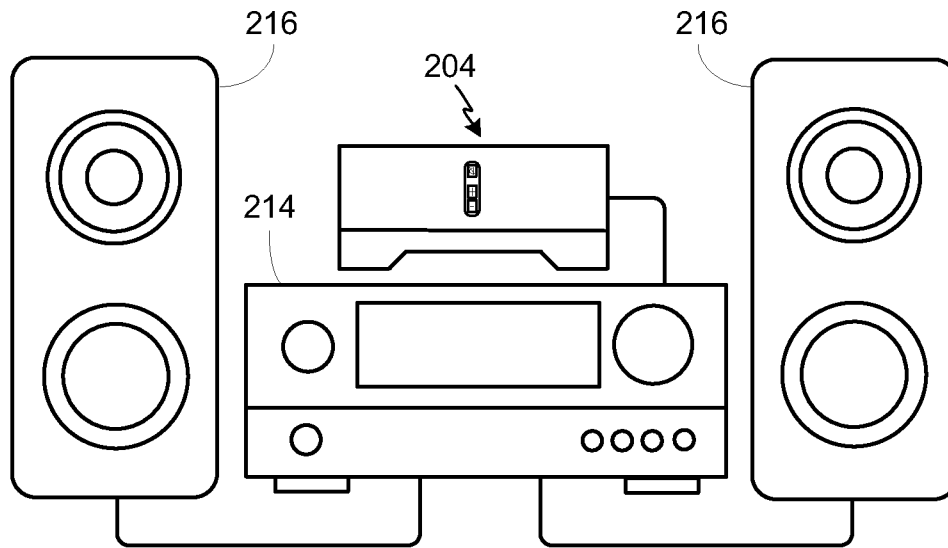


FIGURE 2C

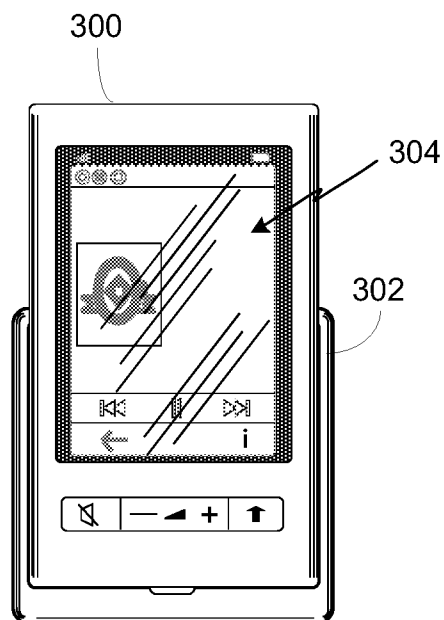


FIGURE 3

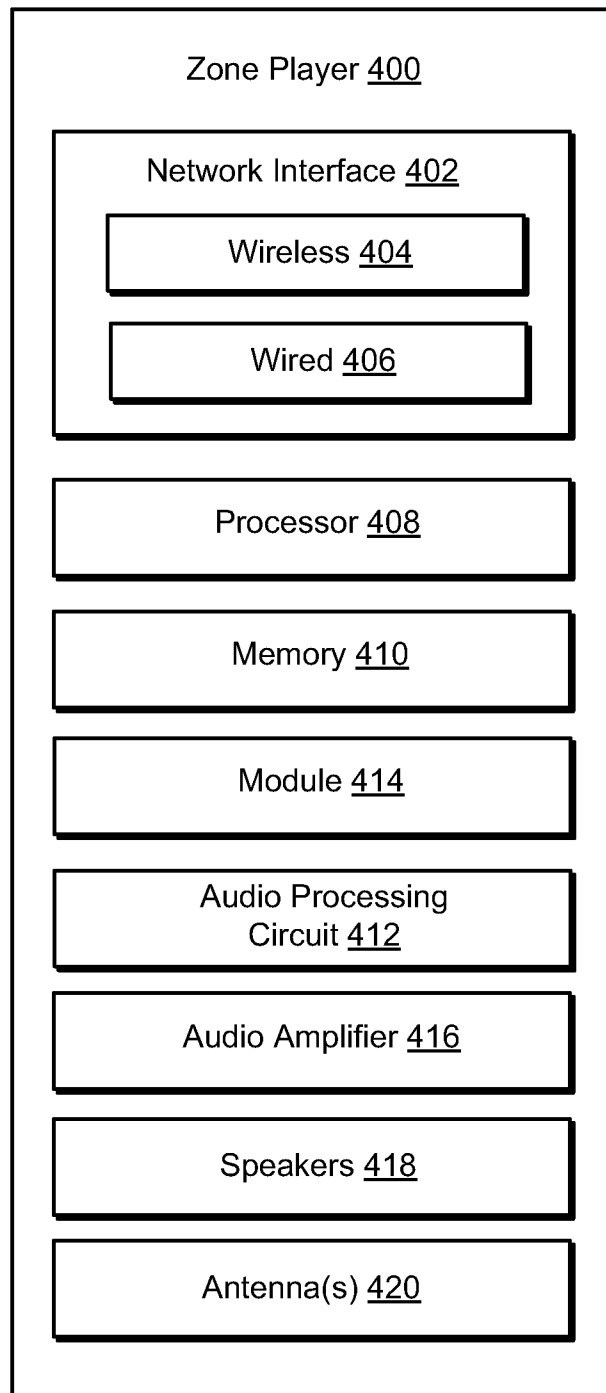


FIGURE 4

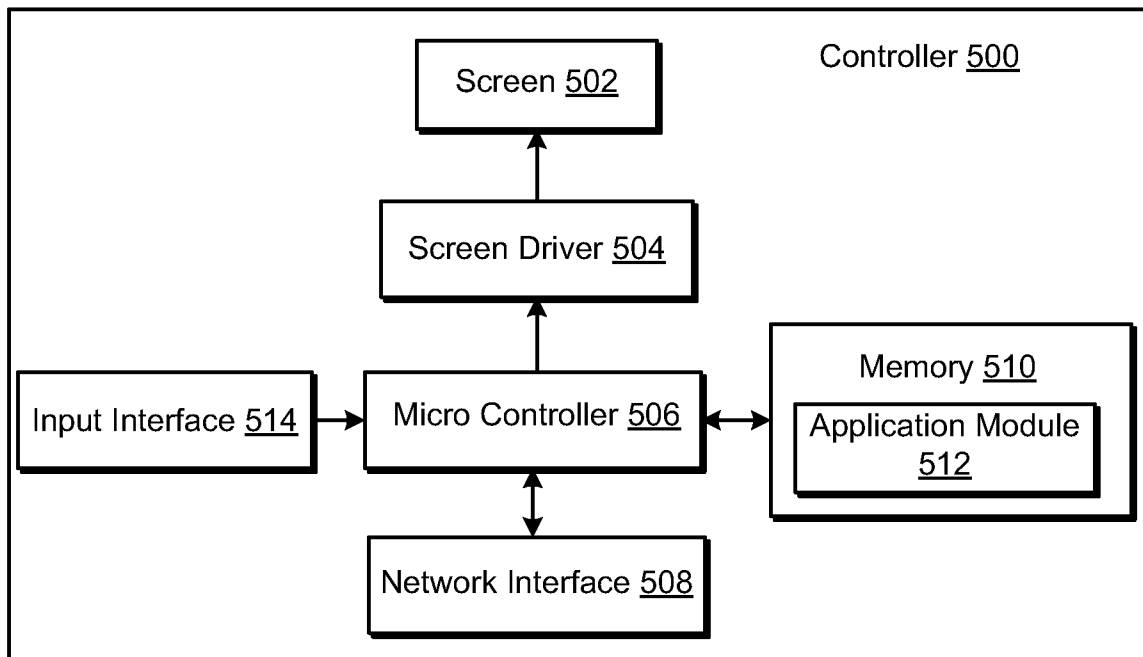


FIGURE 5

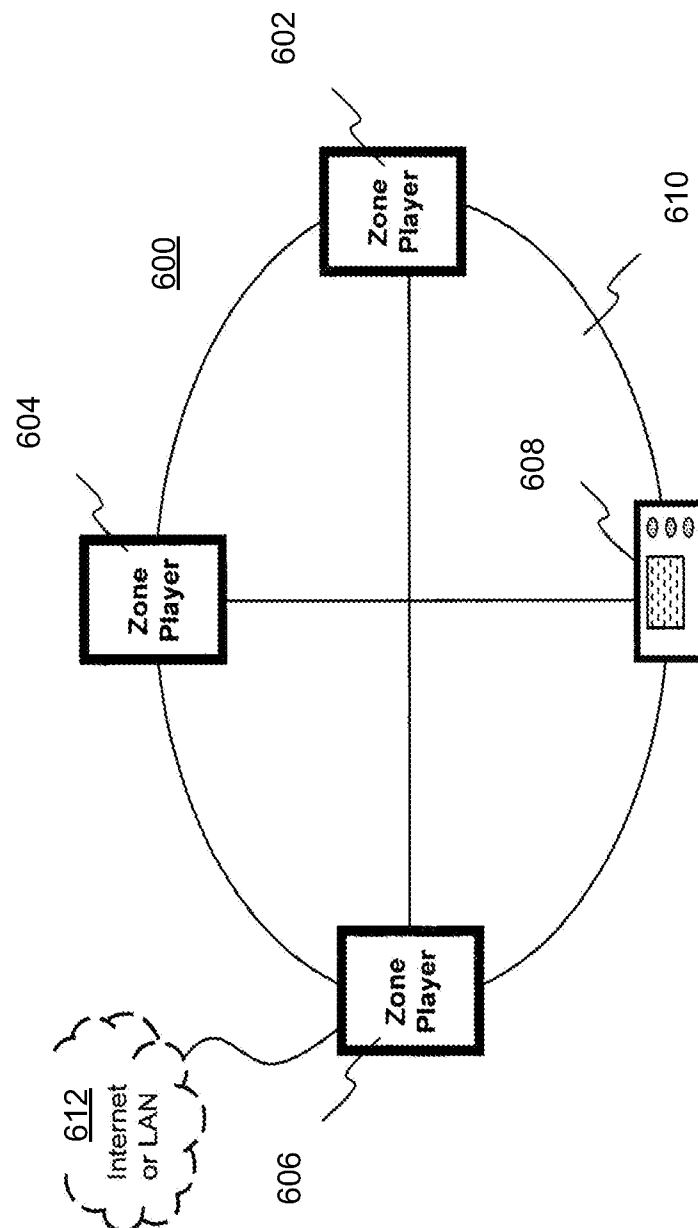


FIGURE 6

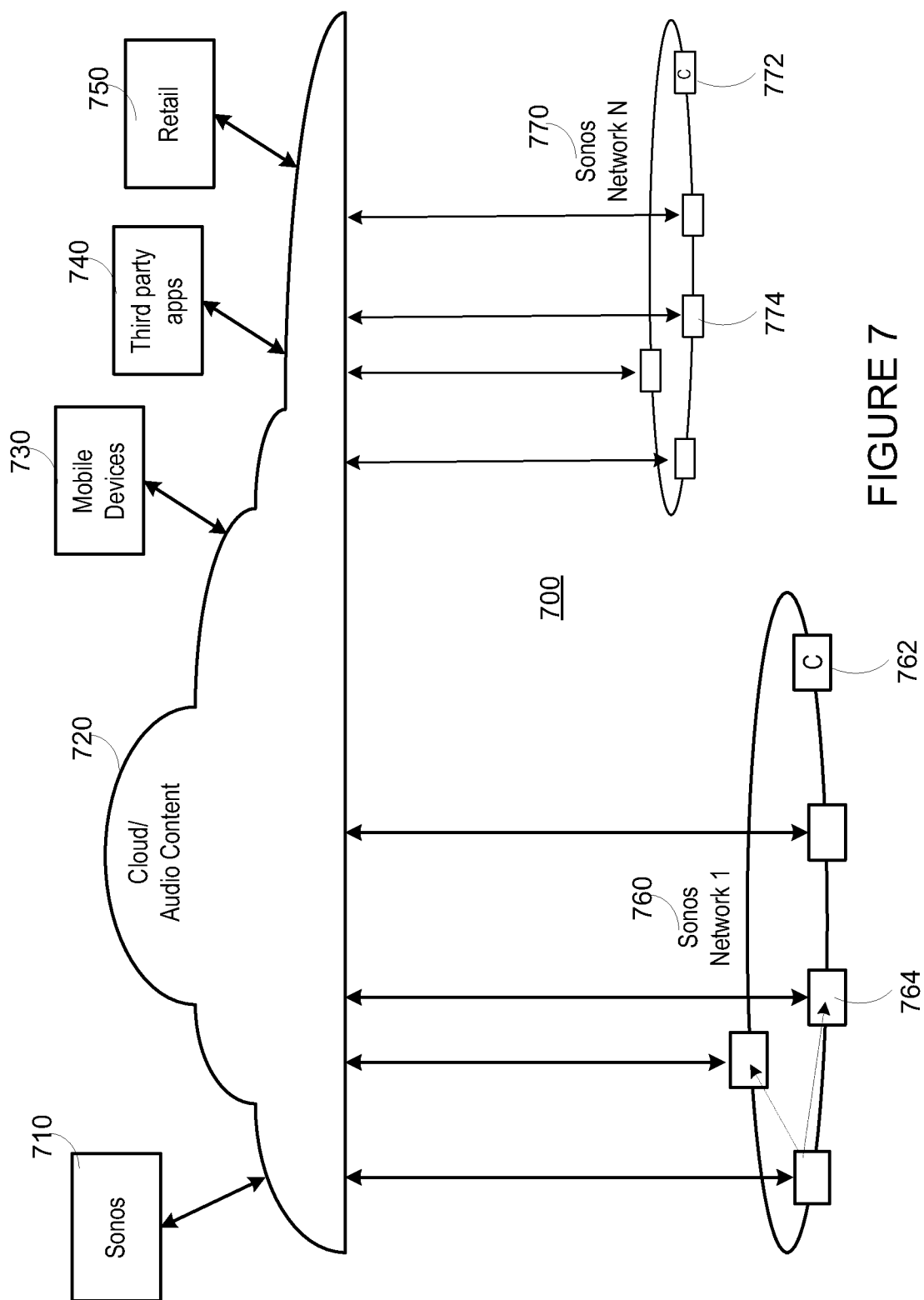


FIGURE 7

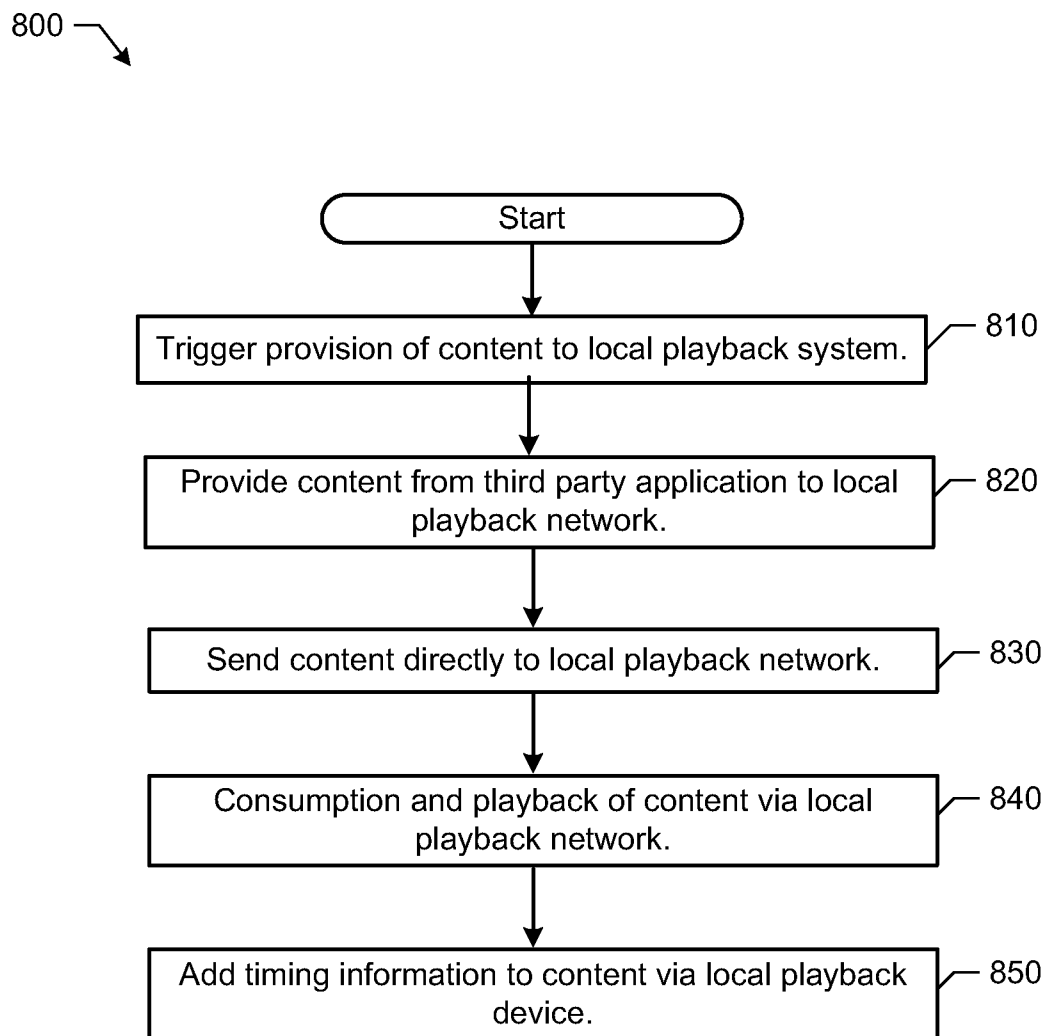


FIGURE 8

900 ↘

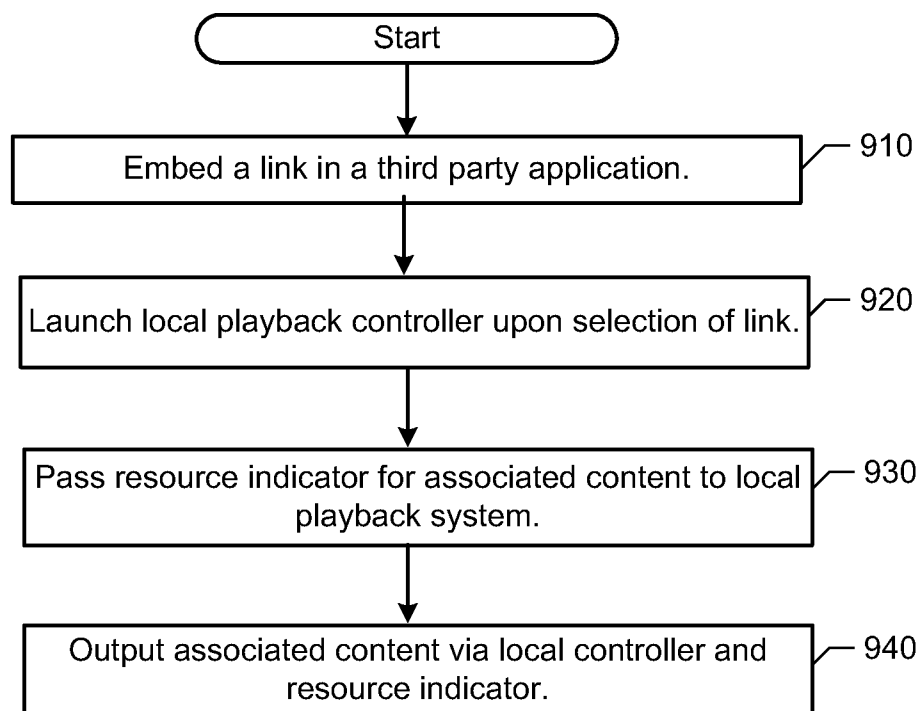


FIGURE 9

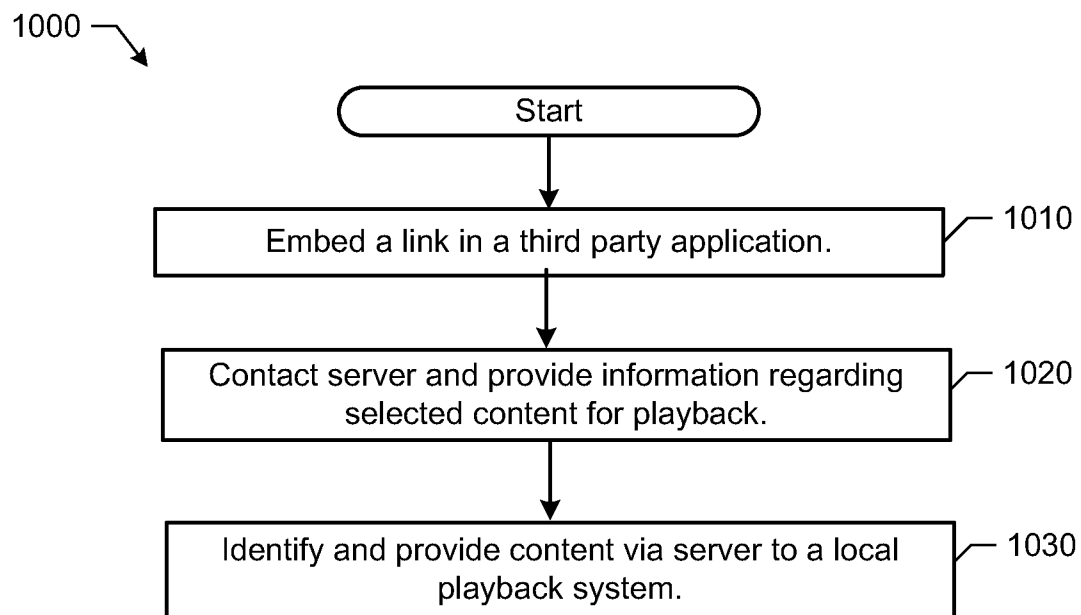


FIGURE 10

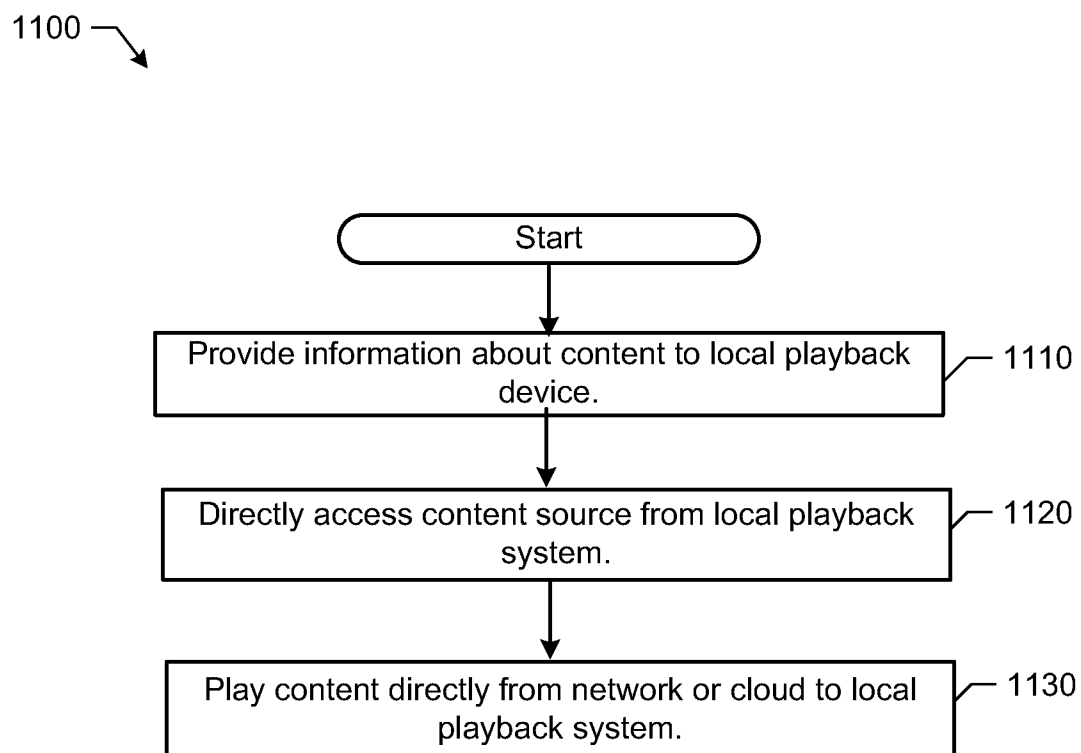


FIGURE 11

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**SYSTEMS AND METHODS FOR
NETWORKED MUSIC PLAYBACK****CROSS REFERENCE TO RELATED
APPLICATIONS**

This application is a continuation of U.S. non-provisional patent application Ser. No. 15/872,500, filed on Jan. 16, 2018, entitled "Systems and Methods for Networked Music Playback," which is a continuation of U.S. non-provisional patent application Ser. No. 14/520,578, filed on Oct. 22, 2014, entitled "Systems and Methods for Networked Music Playback," which is a continuation of U.S. non-provisional patent application Ser. No. 13/341,237, filed on Dec. 30, 2011, entitled "Systems and Methods for Networked Music Playback," all of which are incorporated herein by reference in their entirety.

FIELD OF THE DISCLOSURE

The disclosure is related to consumer electronics and, more particularly, to providing music for playback via one or more devices on a playback data network.

BACKGROUND

Technological advancements have increased the accessibility of music content, as well as other types of media, such as television content, movies, and interactive content. For example, a user can access audio, video, or both audio and video content over the Internet through an online store, an Internet radio station, an online music service, an online movie service, and the like, in addition to the more traditional avenues of accessing audio and video content. Demand for such audio and video content continues to surge. Given the high demand, technology used to access and play such content has likewise improved.

BRIEF DESCRIPTION OF THE DRAWINGS

Features, aspects, and advantages of the presently disclosed technology are better understood with regard to the following description, appended claims, and accompanying drawings where:

FIG. 1 shows an illustration of an example system in which embodiments of the methods and apparatus disclosed herein can be implemented;

FIG. 2A shows an illustration of an example zone player having a built-in amplifier and speakers;

FIG. 2B shows an illustration of an example zone player having a built-in amplifier and connected to external speakers;

FIG. 2C shows an illustration of an example zone player connected to an A/V receiver and speakers;

FIG. 3 shows an illustration of an example controller;

FIG. 4 shows an internal functional block diagram of an example zone player;

FIG. 5 shows an internal functional block diagram of an example controller;

FIG. 6 shows an example ad-hoc playback network;

FIG. 7 shows a system including a plurality of networks including a cloud-based network and at least one local playback network; and

FIGS. 8-11 show flow diagrams for methods to provide audio content to a local playback system.

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In addition, the drawings are for the purpose of illustrating example embodiments, but it is understood that the present disclosure is not limited to the arrangements and instrumentality shown in the drawings.

DETAILED DESCRIPTION**I. Overview**

Wired or wireless networks can be used to connect one or more multimedia playback devices for a home or other location playback network (e.g., a home music system). Certain examples provide automatic configuration of parameters of a playback device to be coupled to a network with reduced or minimum human intervention. For example, a wired and/or wireless ad-hoc network is established to facilitate communications among a group of devices. Music and/or other multimedia content can be shared among devices and/or groups of devices (also referred to herein as zones) associated with a playback network.

Certain embodiments facilitate streaming or otherwise providing music from a music-playing application (e.g., browser-based application, native music player, other multimedia application, and so on) to a multimedia content playback (e.g., Sonos™) system. Certain embodiments provide simple, easy-to-use and secure systems and methods for multimedia content playback across a plurality of systems and locations. Certain embodiments facilitate integration between content partners and a playback system as well as supporting maintenance of such content and system.

Although the following discloses example systems, methods, apparatus, and articles of manufacture including, among other components, firmware and/or software executed on hardware, it should be noted that such systems, methods, apparatus, and/or articles of manufacture are merely illustrative and should not be considered as limiting. For example, it is contemplated that any or all of these firmware, hardware, and/or software components could be embodied exclusively in hardware, exclusively in software, exclusively in firmware, or in any combination of hardware, software, and/or firmware. Accordingly, while the following describes example systems, methods, apparatus, and/or articles of manufacture, the examples provided are not the only way(s) to implement such systems, methods, apparatus, and/or articles of manufacture.

When any of the appended claims are read to cover a purely software and/or firmware implementation, at least one of the elements in at least one example is hereby expressly defined to include a tangible medium such as a memory, DVD, CD, Blu-ray, and so on, storing the software and/or firmware.

Reference herein to "embodiment" means that a particular feature, structure, or characteristic described in connection with the embodiment can be included in at least one example embodiment of the invention. The appearances of this phrase in various places in the specification are not necessarily all referring to the same embodiment, nor are separate or alternative embodiments mutually exclusive of other embodiments. As such, the embodiments described herein, explicitly and implicitly understood by one skilled in the art, can be combined with other embodiments.

Certain embodiments provide a method to provide content to a local playback network. The example method includes identifying multimedia content from a content provider. The example method includes passing information regarding the multimedia content to a local playback system including one or more multimedia playback devices in response to a trigger. The example method includes facilitating play of the

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multimedia content via a local playback network associated with the local playback system.

Certain embodiments provide a computer readable storage medium including instructions for execution by a processor, the instructions, when executed, cause the processor to implement a method to provide content to a local playback network. The example method includes identifying multimedia content from a content provider. The example method includes passing information regarding the multimedia content to a local playback system including one or more multimedia playback devices in response to a trigger. The example method includes facilitating play of the multimedia content via a local playback network associated with the local playback system.

Certain embodiments provide a multimedia playback device including a wireless communication interface to communicate with a local playback network and a multimedia content source and a processor. The process is to identify multimedia content from the multimedia content source; pass information regarding the multimedia content to device on the local playback network in response to a trigger; and facilitate play of the multimedia content via the devices on the local playback network.

II. Example Environment

Referring now to the drawings, in which like numerals can refer to like parts throughout the figures, FIG. 1 shows an example system configuration 100 in which one or more of the method and/or apparatus disclosed herein can be practiced or implemented. By way of illustration, the system configuration 100 represents a home with multiple zones. Each zone, for example, represents a different room or space, such as an office, bathroom, bedroom, kitchen, dining room, family room, home theater room, utility or laundry room, and patio. While not shown here, a single zone can cover more than one room or space. One or more of zone players 102-124 are shown in each respective zone. A zone player 102-124, also referred to as a playback device, multimedia unit, speaker, and so on, provides audio, video, and/or audiovisual output. A controller 130 (e.g., shown in the kitchen for purposes of illustration) provides control to the system configuration 100. The system configuration 100 illustrates an example whole house audio system, though it is understood that the technology described herein is not limited to its particular place of application or to an expansive system like a whole house audio system 100 of FIG. 1.

FIGS. 2A, 2B, and 2C show example illustrations of zone players 200-204. The zone players 200-204 of FIGS. 2A, 2B, and 2C, respectively, can correspond to any of the zone players 102-124 of FIG. 1. While certain embodiments provide multiple zone players, an audio output can be generated using only a single zone player. FIG. 2A illustrates a zone player 200 including sound producing equipment 208 capable of generating sound or an audio output corresponding to a signal received (e.g., wirelessly and/or via a wired interface). The sound producing equipment 208 of the zone player 200 of FIG. 2A includes a built-in amplifier (not shown in this illustration) and speakers (e.g., a tweeter, a mid-range driver, and/or a subwoofer). In certain embodiments, the zone player 200 of FIG. 2A can be configured to play stereophonic audio or monaural audio. In some embodiments, the zone player 200 of FIG. 2A can be configured as a component in a combination of zone players to play stereophonic audio, monaural audio, and/or surround audio. As described in greater detail below, in some embodiments, the example zone player 200 of FIG. 2A can also transmit a second signal to, for example, other zone player(s) in the same or different zone(s), speaker(s), receiver(s), and so on.

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er(s), and so on. Transmission of the second signal can be part of, for example, a system in which multiple zone players, speakers, receivers, and so on, form a network to, for example, present media content in a synchronization or distributed manner.

The example zone player 202 of FIG. 2B includes a built-in amplifier (not shown in this illustration) to power a set of detached speakers 210. The speakers 210 of FIG. 2B can include, for example, any type of loudspeaker. The zone player 202 of FIG. 2B can communicate a signal corresponding to audio content to the detached speakers 210 via wired and/or wireless channels. Instead of receiving and generating audio content as in FIG. 2A, the zone player 202 of FIG. 2B receives the audio content and transmits the same (e.g., after processing the received signal) to the detached speakers 210. Similar to the example zone player 200 of FIG. 2A, in some embodiments the zone player 202 can transmit a second signal to, for example, other zone player(s) in the same or different zone(s), speaker(s), receiver(s), and so on.

The example zone player 204 of FIG. 2C does not include an amplifier, but allows a receiver 214, or another audio and/or video type device with built-in amplification, to connect to a data network 128 of FIG. 1 and to play audio received over the data network 128 via the receiver 214 and a set of detached speakers 216. In addition to the wired couplings shown in FIG. 2C, the detached speakers 216 can receive audio content via a wireless communication channel between the detached speakers 216 and, for example, the zone player 204 and/or the receiver 214. In some embodiments the zone player 202 can transmit a second signal to, for example, other zone player(s) in the same or different zone(s), speaker(s), receiver(s), and so on.

Example zone players include a "Sonos® S5," "Sonos Play:5," "Sonos Play:3," "ZonePlayer 120," and "ZonePlayer 90," which are offered by Sonos, Inc. of Santa Barbara, Calif. Any other past, present, and/or future zone players can additionally or alternatively be used to implement the zone players of example embodiments disclosed herein. A zone player can also be referred to herein as a playback device, and a zone player is not limited to the particular examples illustrated in FIGS. 2A, 2B, and 2C. For example, a zone player can include a wired or wireless headphone. In other examples, a zone player might include a subwoofer. In yet other examples, a zone player can include a sound bar. In an example, a zone player can include or interact with a docking station for an Apple iPod™ or similar device. In some embodiments, a zone player can relay one or more signals received from, for example, a first zone player to another playback device. In some embodiments, a zone player can receive a first signal and generate an output corresponding to the first signal and, simultaneously or separately, can receive a second signal and transmit or relay the second signal to another zone player(s), speaker(s), receiver(s), and so on. Thus, an example zone player described herein can act as a playback device and, at the same time, operate as a hub in a network of zone players. In such instances, media content corresponding to the first signal can be different from the media content corresponding to the second signal.

FIG. 3 shows an example illustration of a wireless controller 300 in a docking station 302. The controller 300 can correspond to the controlling device 130 of FIG. 1. The controller 300 is provided with a touch screen 304 that allows a user to interact with the controller 300, for example, to retrieve and navigate a playlist of audio items, control operations of one or more zone players, and provide overall

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control of the system configuration 100. In certain embodiments, any number of controllers can be used to control the system configuration 100. In certain embodiments, there can be a limit on the number of controllers that can control the system configuration 100. The controllers might be wireless like wireless controller 300 or wired to the data network 128. Furthermore, an application running on any network-enabled portable devices, such as an iPhone™, iPad™, Android™ powered phone, or any other smart phone or network-enabled device can be used as a controller by connecting to the data network 128. An application running on a laptop or desktop PC or Mac can also be used as a controller. Example controllers include a “Sonos® Controller 200,” “Sonos® Controller for iPhone,” “Sonos® Controller for iPad,” “Sonos® Controller for Android,” “Sonos® Controller for Mac or PC,” which are offered by Sonos, Inc. of Santa Barbara, Calif. The flexibility of such an application and its ability to be ported to a new type of portable device is advantageous.

Referring back to the system configuration 100 of FIG. 1, a particular zone can contain one or more zone players. For example, the family room of FIG. 1 contains two zone players 106 and 108, while the kitchen is shown with one zone player 102. Zones can be dynamically configured by positioning a zone player in a room or space and assigning via the controller 130 the zone player to a new or existing zone. As such, zones can be created, combined with another zone, removed, and given a specific name (e.g., “Kitchen”), if so programmed. The zone players 102 to 124 are coupled directly or indirectly to a data network, such as the data network 128 shown in FIG. 1. The data network 128 is represented by an octagon in the figure to stand out from other components shown in the figure. While the data network 128 is shown in a single location, it is understood that such a network can be distributed in and around the system configuration 100.

Particularly, the data network 128 can be a wired network, a wireless network, or a combination of both. In some embodiments, one or more of the zone players 102-124 are wirelessly coupled to the data network 128 based on a proprietary mesh network. In some embodiments, one or more of the zone players 102-124 are wirelessly coupled to the data network 128 using a non-mesh topology. In some embodiments, one or more of the zone players 102-124 are coupled via a wire to the data network 128 using Ethernet or similar technology. In addition to the one or more zone players 102-124 connecting to the data network 128, the data network 128 can further allow access to a wide area network, such as the Internet.

In certain embodiments, the data network 128 can be created by connecting any of the zone players 102-124, or some other connecting device, to a broadband router. Other zone players 102-124 can then be added wired or wirelessly to the data network 128. For example, a zone player (e.g., any of zone players 102-124) can be added to the system configuration 100 by simply pressing a button on the zone player itself, which enables a connection to be made to the data network 128. The broadband router can be connected to an Internet Service Provider (ISP), for example. The broadband router can be used to form another data network within the system configuration 100, which can be used in other applications (e.g., web surfing). The data network 128 can also be used in other applications, if so programmed. Further, in certain embodiments, the data network 128 is the same network used for other applications in the household.

In certain embodiments, each zone can play from the same audio source as another zone or each zone can play

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from a different audio source. For example, someone can be grilling on the patio and listening to jazz music via zone player 124, while someone is preparing food in the kitchen and listening to classical music via zone player 102. Further, someone can be in the office listening to the same jazz music via zone player 110 that is playing on the patio via zone player 124. In some embodiments, the jazz music played via zone players 110 and 124 is played in synchrony. Synchronizing playback amongst zones allows for someone to pass through zones while seamlessly listening to the audio. Further, zones can be put into a “party mode” such that all associated zones will play audio in synchrony.

In certain embodiments, a zone contains two or more zone players. For example, the family room contains two zone players 106 and 108, and the home theater room contains at least zone players 116, 118, and 120. A zone can be configured to contain as many zone players as desired, and for example, the home theater room might contain additional zone players to play audio from a 5.1 channel or greater audio source (e.g., a movie encoded with 5.1 or greater audio channels). If a zone contains two or more zone players, such as the two zone players 106 and 108 in the family room, then the two zone players 106 and 108 can be configured to play the same audio source in synchrony, or the two zone players 106 and 108 can be paired to play two separate sounds in left and right channels, for example. In other words, the stereo effects of a sound can be reproduced or enhanced through the two zone players 106 and 108, one for the left sound and the other for the right sound. In certain embodiments, paired zone players can play audio in synchrony with other zone players.

In certain embodiments, three or more zone players can be configured to play various channels of audio that is encoded with three channels or more sound. For example, the home theater room shows zone players 116, 118, and 120. If the sound is encoded as 2.1 channel audio, then the zone player 116 can be configured to play left channel audio, the zone player 118 can be configured to play right channel audio, and the zone player 120 can be configured to play bass frequencies. Other configurations are possible and depend on the number of zone players and the type of audio. Further, a particular zone can be configured to play a 5.1 channel audio in one instance, such as when playing audio from a movie, and then dynamically switch to play stereo, such as when playing audio from a two channel source.

In certain embodiments, two or more zone players can be sonically consolidated to form a single, consolidated zone player. A consolidated zone player (though made up of multiple, separate devices) can be configured to process and reproduce sound differently than an unconsolidated zone player or zone players that are paired, because a consolidated zone player will have additional speaker drivers from which sound can be passed. The consolidated zone player can further be paired with a single zone player or yet another consolidated zone player. Each playback device of a consolidated playback device is preferably set in a consolidated mode.

According to some embodiments, one can continue to do any of: group, consolidate, and pair zone players, for example, until a desired configuration is complete. The actions of grouping, consolidation, and pairing are preferably performed through a control interface, such as using controller 130, and not by physically connecting and re-connecting speaker wire, for example, to individual, discrete speakers to create different configurations. As such, certain

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embodiments described herein provide a more flexible and dynamic platform through which sound reproduction can be offered to the end-user.

Sources of audio content to be played by zone players **102-124** are numerous. Music from a personal library stored on a computer or networked-attached storage (NAS) can be accessed via the data network **128** and played. Internet radio stations, shows, and podcasts can be accessed via the data network **128**. Music services that let a user stream and download music and audio content can be accessed via the data network **128**. Further, music can be obtained from traditional sources, such as a turntable or CD player, via a line-in connection to a zone player, for example. Audio content can also be accessed through AirPlay™ wireless technology by Apple, Inc., for example. Audio content received from one or more sources can be shared amongst the zone players **102** to **124** via the data network **128** and/or the controller **130**. The above-disclosed sources of audio content are referred to herein as network-based audio information sources. However, network-based audio information sources are not limited thereto.

The example home theater zone players **116**, **118**, **120** are coupled to an audio information source such as a television **132**. In some examples, the television **132** is used as a source of audio for the home theater zone players **116**, **118**, **120**, while in other examples audio information from the television **132** can be shared with any of the zone players **102-124** in the audio system **100**.

III. Example Playback Device

Referring now to FIG. 4, there is shown an example functional block diagram of a zone player **400** in accordance with an embodiment. The zone player **400** of FIG. 4 includes a network interface **402**, a processor **408**, a memory **410**, an audio processing component **412**, a module **414**, an audio amplifier **416**, and a speaker unit **418** coupled to the audio amplifier **416**. FIG. 2A shows an example illustration of such a zone player. Other types of zone players can not include the speaker unit **418** (e.g., such as shown in FIG. 2B) or the audio amplifier **416** (e.g., such as shown in FIG. 2C). Further, it is contemplated that the zone player **400** can be integrated into another component. For example, the zone player **400** could be constructed as part of a lamp for indoor or outdoor use.

Referring back to FIG. 4, the network interface **402** facilitates a data flow between zone players and other devices on a data network (e.g., the data network **128** of FIG. 1) and the zone player **400**. In some embodiments, the network interface **402** can manage the assembling of an audio source or file into smaller packets that are to be transmitted over the data network or reassembles received packets into the original source or file. In some embodiments, the network interface **402** can further handle the address part of each packet so that it gets to the right destination or intercepts packets destined for the zone player **400**. Accordingly, in certain embodiments, each of the packets includes an Internet Protocol (IP)-based source address as well as an IP-based destination address.

In some embodiments, the network interface **402** can include one or both of a wireless interface **404** and a wired interface **406**. The wireless interface **404**, also referred to as an RF interface, provides network interface functions for the zone player **400** to wirelessly communicate with other devices (e.g., other zone player(s), speaker(s), receiver(s), component(s) associated with the data network **128**, and so on) in accordance with a communication protocol (e.g., any of the wireless standards IEEE 802.11a, 802.11b, 802.11g, 802.11n, or 802.15). To receive wireless signals and to

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provide the wireless signals to the wireless interface **404** and to transmit wireless signals, the zone player **400** of FIG. 4 includes one or more antennas **420**. The wired interface **406** provides network interface functions for the zone player **400** to communicate over a wire with other devices in accordance with a communication protocol (e.g., IEEE 802.3). In some embodiments, a zone player includes both of the interfaces **404** and **406**. In some embodiments, a zone player **400** includes only the wireless interface **404** or the wired interface **406**.

In some embodiments, the processor **408** is a clock-driven electronic device that is configured to process input data according to instructions stored in memory **410**. The memory **410** is data storage that can be loaded with one or more software modules **414**, which can be executed by the processor **408** to achieve certain tasks. In the illustrated embodiment, the memory **410** is a tangible machine readable medium storing instructions that can be executed by the processor **408**. In some embodiments, a task might be for the zone player **400** to retrieve audio data from another zone player or a device on a network. In some embodiments, a task might be for the zone player **400** to send audio data to another zone player or device on a network. In some embodiments, a task might be for the zone player **400** to synchronize playback of audio with one or more additional zone players. In some embodiments, a task might be to pair the zone player **400** with one or more zone players to create a multi-channel audio environment. Additional or alternative tasks can be achieved via the one or more software modules **414** and the processor **408**.

The audio processing component **412** can include one or more digital-to-analog converters (DAC), an audio preprocessing component, an audio enhancement component or a digital signal processor, and so on. In certain embodiments, the audio that is retrieved via the network interface **402** is processed and/or intentionally altered by the audio processing component **412**. Further, the audio processing component **412** can produce analog audio signals. The processed analog audio signals are then provided to the audio amplifier **416** for play back through speakers **418**. In addition, the audio processing component **412** can include necessary circuitry to process analog or digital signals as inputs to play from zone player **400**, send to another zone player on a network, or both play and send to another zone player on the network. An example input includes a line-in connection (e.g., an auto-detecting 3.5 mm audio line-in connection).

The audio amplifier **416** is a device that amplifies audio signals to a level for driving one or more speakers **418**. The one or more speakers **418** can include an individual transducer (e.g., a “driver”) or a complete speaker system that includes an enclosure including one or more drivers. A particular driver can be a subwoofer (for low frequencies), a mid-range driver (middle frequencies), and a tweeter (high frequencies), for example. An enclosure can be sealed or ported, for example.

A zone player **400** can also be referred to herein as a playback device. An example playback device includes a Sonos® Play:5, which is manufactured by Sonos, Inc. of Santa Barbara, Calif. The Play:5 is an example zone player with a built-in amplifier and speakers. In particular, the Play:5 is a five-driver speaker system that includes two tweeters, two mid-range drivers, and one subwoofer. When playing audio content via the Play:5, the left audio data of a track is sent out of the left tweeter and left mid-range driver, the right audio data of a track is sent out of the right tweeter and the right mid-range driver, and mono bass is sent out of the subwoofer. Further, both mid-range drivers and

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both tweeters have the same equalization (or substantially the same equalization). That is, they are both sent the same frequencies, just from different channels of audio. Audio from Internet radio stations, online music and video services, downloaded music, analog audio inputs, television, DVD, and so on, can be played from a Sonos® Play:5. While the Play:5 is an example of a zone player with speakers, it is understood that a zone player with speakers is not limited to one with a certain number of speakers (e.g., five speakers as in the Play:5), but rather can contain one or more speakers. Further, a zone player can be part of another device, which might even serve a purpose different than audio (e.g., a lamp).

IV. Example Controller

Referring now to FIG. 5, there is shown an example controller 500, which can correspond to the controlling device 130 in FIG. 1. The controller 500 can be used to facilitate the control of multi-media applications, automation and others in a system. In particular, the controller 500 is configured to facilitate a selection of a plurality of audio sources available on the network and enable control of one or more zone players (e.g., the zone players 102-124 in FIG. 1) through a wireless network interface 508. According to one embodiment, the wireless communications is based on an industry standard (e.g., infrared, radio, wireless standards IEEE 802.11a, 802.11b 802.11g, 802.11n, or 802.15). Further, when a particular audio is being accessed via the controller 500 or being played via a zone player, a picture (e.g., album art) or any other data, associated with the audio source can be transmitted from a zone player or other electronic device to the controller 500 for display.

The controller 500 is provided with a screen 502 and an input interface 514 that allows a user to interact with the controller 500, for example, to navigate a playlist of many multimedia items and to control operations of one or more zone players. The screen 502 on the controller 500 can be an LCD screen, for example. The screen 500 communicates with and is commanded by a screen driver 504 that is controlled by a microcontroller (e.g., a processor) 506. The memory 510 can be loaded with one or more application modules 512 that can be executed by the microcontroller 506 with or without a user input via the user interface 514 to achieve certain tasks. In some embodiments, an application module 512 is configured to facilitate grouping a number of selected zone players into a zone group and synchronizing the zone players for audio play back. In some embodiments, an application module 512 is configured to control the audio sounds (e.g., volume) of the zone players in a zone group. In operation, when the microcontroller 506 executes one or more of the application modules 512, the screen driver 504 generates control signals to drive the screen 502 to display an application specific user interface accordingly.

The controller 500 includes a network interface 508 that facilitates wireless communication with a zone player. In some embodiments, the commands such as volume control and audio playback synchronization are sent via the network interface 508. In some embodiments, a saved zone group configuration is transmitted between a zone player and a controller via the network interface 508. The controller 500 can control one or more zone players, such as 102-124 of FIG. 1. There can be more than one controller for a particular system. Further, a controller can be integrated into a zone player.

It should be noted that other network-enabled devices such as an iPhone®, iPad® or any other smart phone or network-enabled device (e.g., a networked computer such as

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a PC or Mac®) can also be used as a controller to interact or control zone players in a particular environment. In some embodiments, a software application or upgrade can be downloaded onto a network enabled device to perform the functions described herein.

In certain embodiments, a user can create a zone group including at least two zone players from the controller 500. The zone players in the zone group can play audio in a synchronized fashion, such that all of the zone players in the zone group play back an identical audio source or a list of identical audio sources in a synchronized manner such that no (or substantially no) audible delays or hiccups could be heard. Similarly, in some embodiments, when a user increases the audio volume of the group from the controller 500, the signals or data of increasing the audio volume for the group are sent to one of the zone players and causes other zone players in the group to be increased together in volume.

A user via the controller 500 can group zone players into a zone group by activating a “Link Zones” or “Add Zone” soft button, or de-grouping a zone group by activating an “Unlink Zones” or “Drop Zone” button. For example, one mechanism for ‘joining’ zone players together for audio play back is to link a number of zone players together to form a group. To link a number of zone players together, a user can manually link each zone player or room one after the other. For example, assume that there is a multi-zone system that includes the following zones: Bathroom, Bedroom, Den, Dining Room, Family Room, and Foyer.

In certain embodiments, a user can link any number of the six zone players, for example, by starting with a single zone and then manually linking each zone to that zone.

In certain embodiments, a set of zones can be dynamically linked together using a command to create a zone scene or theme (subsequent to first creating the zone scene). For instance, a “Morning” zone scene command can link the Bedroom, Office, and Kitchen zones together in one action. Without this single command, the user would need to manually and individually link each zone. The single command might include a mouse click, a double mouse click, a button press, a gesture, or some other programmed action. Other kinds of zone scenes can be programmed.

In certain embodiments, a zone scene can be triggered based on time (e.g., an alarm clock function). For instance, a zone scene can be set to apply at 8:00 am. The system can link appropriate zones automatically, set specific music to play, and then stop the music after a defined duration. Although any particular zone can be triggered to an “On” or “Off” state based on time, for example, a zone scene enables any zone(s) linked to the scene to play a predefined audio (e.g., a favorable song, a predefined playlist) at a specific time and/or for a specific duration. If, for any reason, the scheduled music failed to be played (e.g., an empty playlist, no connection to a share, failed Universal Plug and Play (UPnP), no Internet connection for an Internet Radio station, and so on), a backup buzzer can be programmed to sound. The buzzer can include a sound file that is stored in a zone player, for example.

V. Example Ad-Hoc Network

Certain particular examples will now be provided in connection with FIGS. 6-8B to describe, for purposes of illustration only, certain base systems and methods to provide and facilitate connection to a playback network. FIG. 6 shows that there are three zone players 602, 604 and 606 and a controller 608 that form a network branch that is also referred to as an Ad-Hoc network 610. The network 610 may be wireless, wired, or a combination of wired and wireless. In general, an Ad-Hoc (or “spontaneous”) network is a local

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area network or other small network in which there is no one access point for all traffic. With an established Ad-Hoc network **610**, the devices **602**, **604**, **606** and **608** can all communicate with each other in a “peer-to-peer” style of communication, for example. Furthermore, devices may come/and go from the network **610**, and the network **610** will automatically reconfigure itself without needing the user to reconfigure the network **610**.

Using the Ad-Hoc network **610**, the devices **602**, **604**, **606**, and **608** can share or exchange one or more audio sources and be grouped to play the same or different audio sources. For example, the devices **602** and **604** are grouped to playback one piece of music, and at the same time, the device **606** plays back another piece of music. In other words, the devices **602**, **604**, **606** and **608**, as shown in FIG. **6**, form a HOUSEHOLD that distributes audio and/or reproduces sound. As used herein, the term HOUSEHOLD (provided in uppercase letters to disambiguate from the user’s domicile) is used to represent a collection of networked devices that are cooperating to provide an application or service. An instance of a HOUSEHOLD is identified with a household **10** (or household identifier).

In certain embodiments, a household identifier (HHID) is a short string or an identifier that is computer-generated to help ensure that it is unique. Accordingly, the network **610** can be characterized by a unique HHID and a unique set of configuration variables or parameters, such as channels (e.g., respective frequency bands), SSID (a sequence of alphanumeric characters as a name of a wireless network), and WEP keys (wired equivalent privacy or other security keys). In certain embodiments, SSID is set to be the same as HHID.

In certain embodiments, each HOUSEHOLD includes two types of network nodes: a control point (CP) and a zone player (ZP). The control point controls an overall network setup process and sequencing, including an automatic generation of required network parameters (e.g., WEP keys). In an embodiment, the CP also provides the user with a HOUSEHOLD configuration user interface. The CP function can be provided by a computer running a CP application module, or by a handheld controller (e.g., the controller **308**) also running a CP application module, for example. The zone player is any other device on the network that is placed to participate in the automatic configuration process. The ZP, as a notation used herein, includes the controller **308** or a computing device, for example.

In certain embodiments, configuration of a HOUSEHOLD involves multiple CPs and ZPs that rendezvous and establish a known configuration such that they can use a standard networking protocol (e.g., IP over Wired or Wireless Ethernet) for communication. In an embodiment, two types of networks/protocols are employed: Ethernet 802.3 and Wireless 802.11g. Interconnections between a CP and a ZP can use either of the networks/protocols. A device in the system as a member of a HOUSEHOLD can connect to both networks simultaneously. In an environment that has both networks in use, it is assumed that at least one device in a system is connected to both as a bridging device, thus providing bridging services between wired/wireless networks for others. The zone player **606** in FIG. **6** is shown to be connected to both networks, for example. The connectivity to the network **612** is based on Ethernet while the connectivity to other devices **602**, **604** and **608** is based on Wireless. It is understood, however, that in some embodiments each zone player **606**, **604**, **602** may access the Internet when retrieving media from the cloud (e.g., Internet) via the bridging device. For example, zone player **602** may contain a uniform resource locator (URL) that specifies

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an address to a particular audio track in the cloud. Using the URL, the zone player **602** may retrieve the audio track from the cloud, and ultimately play the audio out of one or more zone players.

VI. Example Music Sharing and Playback Configuration

Certain embodiments enable a user to stream music from a music-playing application (e.g., browser-based application, native music player, other multimedia application, and so on) to a local multimedia content playback (e.g., Sonos™) system. Certain embodiments provide secure systems and methods for multimedia content playback across a plurality of systems and locations. Certain embodiments facilitate integration between content partners and a playback system as well as supporting maintenance of such content and system.

FIG. **7** shows a system including a plurality of networks including a cloud-based network and at least one local playback network. The network includes a plurality of playback devices or players, though it is understood that the network may contain only one playback device. In certain embodiments, each player has an ability to retrieve its content for playback. Control and content retrieval can be distributed or centralized, for example. Input can include streaming content provider input, third party application input, mobile device input, user input, and/or other playback network input into the cloud for local distribution and playback.

As illustrated by the example system **700** of FIG. **7**, a plurality of content providers **720-750** can be connected to one or more local playback networks **760-770** via a cloud and/or other network **710**. Using the cloud **710**, a multimedia playback system **720** (e.g., Sonos™) a mobile device **730**, a third party application **740**, a retail location **750**, and so on can provide multimedia content (requested or otherwise) to local playback networks **760**, **770**. Within each local network **760**, **770**, a controller **762**, **772** and/or playback device **764**, **774** can provide a song identifier, song name, playlist identifier, playlist name, genre, preference, and so on, and/or simply receive content from a connected system via the cloud.

For example, a user listens to a third party music application (e.g., Pandora™ Rhapsody™, Spotify™, and so on) on her smart phone while commuting. She’s enjoying the current channel and, as she walks in the door to her home, selects an option to continue playing that channel on her household music playback system (e.g., Sonos™). The playback system picks up from the same spot on the selected channel that was on her phone and outputs that content (e.g., that song) on speakers and/or other playback devices connected to the household playback system. A uniform resource indicator (URI) (e.g., a uniform resource locator (URL)) can be passed to a playback device to fetch content from a cloud and/or other networked source, for example. A playback device, such as a zone player, can fetch content on its own without use of a controller, for example. Once the zone player has a URL (or some other identification or address) for a song and/or playlist, the zone player can run on its own to fetch the content. Songs and/or other multimedia content can be retrieved from the Internet rather than a local device (e.g., a compact disc (CD)), for example. A third party application can open or utilize an application programming interface (API) to pass music to the household playback system without tight coupling to that household playback system.

In another example of an application determining a playlist and/or other content for playback, a user enjoys listening to music on an online music service (e.g., turntable.fm or

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other virtual room that a user can enter to choose from a plurality of online disc jockeys (DJs) deciding what to play next) using his Mac Book Pro™ at home. He likes the unique user experience the service offers, and he frequently hops from room to room discovering new music. To maximize sound quality, he plays the music on his household playback system (e.g., Sonos™). A button or other indicator can be added to the turntable.fm Web application to switch the content being played to the playback system for output (e.g., to the Sonos™ system rather than or in addition to the Mac Book™). While Web-based applications typically do not have access to items on a local network, certain embodiments enable a third-party Web-based application (e.g., Turntable.fm) to talk to a playback system (e.g., Sonos™) in a certain way (e.g., may have to log in with a username and password), and the identified user has the website send audio or video down to a playback device (e.g., a zone player) on the playback system local network to play music there (or some other media).

In another example, a first user creates a playlist (e.g., a Spotify™ playlist). The first user visits a second user's house, pulls out her smart phone and shares her playlist by playing it on the second user's household playback (e.g., Sonos™) system using her third party (e.g., Spotify™) application. The first user may also go to the third party content provider's (e.g., Spotify's™) website and share her playlist on the second user's playback system.

Thus, certain embodiments provide cross-service linking such that a song identifier can be passed from one user and/or service to another to be fetched and played. A user having a playlist on his or her phone can visit a friend and, using her account on her friend's system, play a song to which she has an access right. A retrieved song can be streamed locally to a user's phone, or an application can pass a song identifier to a local playback system which looks up the song identifier and finds an available audio stream to which the user has a right to play and then plays that song.

In another example, a user is staying in a hotel room or other facility including a local playback network. For example, a speaker and/or other playback device (e.g., a Sonos™ Play:3, Play:5 and so on) in a hotel room can be utilized to play multimedia content to which the user has access from his or her playback network account, streaming audio source, third party application, and so on. Content can be output to one or more devices based on availability, access, configuration, priority, preference, and so on. In certain embodiments, a playback network includes a plurality of nodes, and each node has a capability to play sound in response to an input. Requested output is provided to a most logical connection, for example.

In certain embodiments, a phone device, a television device, and so on can be used to play music, audio, video and/or other multimedia content. In an example, a push button on a microphone or household intercom system to tell the kids dinner is ready is provided over the local playback network.

FIG. 8 shows a flow diagram for a method 800 to provide audio content to a local playback system. In the example method 800 of FIG. 8, a third party application acts as a "virtual line-in" to the local playback system. At block 810, streaming of music or other content from a third party application to a local content playback system is triggered. For example, a "Play to Sonos" button is pressed on a Rhapsody™ application. At block 820, content is streamed to one or more components in a household playback network. The music may be streamed to predetermined zones or players in a household, for example. The music may be

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further directed to be played in different zones or players throughout the household. Playback on the local network can be facilitated to one or more zones/players based on a configuration (e.g., a zone scene, theme, and so on). Thus, certain embodiments allow a large degree of flexibility in where the music is actually played. For example, the music can be played in the kitchen, the family room, the patio, and so on. Further, the music may be redirected to different zones.

At block 830, the incoming content (e.g., audio) stream is provided directly from a third party application or other external source to the local playback network for playback. For example, rather than passing track identifiers, an audio stream is provided to a Sonos household system for playback to one or more configured zones. At block 840, the local playback system consumes the stream and plays it as it would other content on the local playback (e.g., Sonos™) network (e.g., via zones and so on). At block 850, a playback device (e.g., a zone player, Play:3™, Play:5™, and so on) adds timing information to the streaming content signal (e.g., the device takes the streaming audio signal and repackages it for local synchronized playback). In some embodiments, timing information is not added to the signal unless two or more playback devices are configured to play the audio in synchrony.

FIG. 9 shows a flow diagram for a method 900 to provide audio content to a local playback system. In the example method 900 of FIG. 9, a uniform resource indicator (URI) handler approach is provided for content output. At block 910, a link or other reference is embedded in a third party application (e.g., Facebook™ or Twitter). At block 920, when the link is selected (e.g., clicked), a local playback (e.g., Sonos™) controller, if available, is launched. At block 930, the application (e.g., accessed on a phone, tablet, computer, and so on) passes a URI for associated content (e.g., an audio track and so on) to a local playback system (e.g., Sonos™) controller. At block 940, the local controller outputs the associated content (e.g., plays the music) via the URI. For example, music is streamed from the cloud to one or more playback devices on the local playback network.

In certain embodiments, an application associated with the operating system can register to handle all URIs (URLs) that start with a certain prefix and can define how data is encoded into those URLs so a local playback system application can generate a link (e.g., "sonos:") and put that link into a message (e.g., email, text message, instant message (IM), etc.). The local playback application registered to handle such URLs can parse the URLs to determine what song, playlist, streaming radio station, etc., to play. This launches the controller application. For example, if a first listener likes a song and tweets that song, Twitter™ can include a clickable link which launches a playback application and starts the music playing on a local playback system if the local system can find the song (e.g., if have the application, if have rights/access to the song, etc.). In certain embodiments, the system knows to trigger the receiving user's system rather than the sending user's system to play associated content based on the transmitted link/identifier.

For example, an application can register with the system to handle all URLs that start with a custom prefix (e.g., an HTTP "scheme"). For instance, Sonos controller apps can register to handle any URL that begins with "sonos:" or "x-sonos:". In certain embodiments, a playback system provider can define and publish the format of its URLs so that any third party application can create a link or reference to content. A large amount of data can be encoded into a URL using query parameters, for example.

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In an example, when an application tries to “open” or “browse” to a URL, the system checks to see if the scheme of the URL matches the “sonos:” scheme that has been registered with the application. If a URL handler application is found, the system launches that application (e.g., the application can but does not need to be running in the background) and passes the URL to the application. The application then parses the URL and executes functionality based on the data in the URL. For example, the URL can contain the name of a music service and a playlist identifier from that service, plus the name of a Sonos™ Zone Player, causing the Sonos controller to start that playlist playing on that zone.

FIG. 10 shows a flow diagram for a method 1000 to provide audio content to a local playback system. In the example method 1000 of FIG. 10, at block 1010, a link or other reference is embedded in a third party application (e.g., Facebook™). At block 1020, when the link is selected, a playback system (e.g., Sonos™) server is contacted and provided with information regarding selected content for playback. For example, rather than launching a local controller application, a server is contacted regarding music for playback on a local network. At block 1030, using the provided information, the server identifies and provides the content locally on a user’s local playback system. For example, the server can then start playing the music directly on the user’s Sonos™ system (e.g., without going through a Sonos™ controller application).

In certain embodiments, a “single sign-on” technology is provided so that the user does not need to re-enter a username and password in order to authenticate to the playback server. Example single sign-on technologies include Facebook Connect™, Windows Live ID™, etc.

In certain embodiments, instead of using a specialized link, such as a “sonos:” link, a normal URL can be used to point to a playback system (e.g., Sonos™) webserver, which generates links with special data embedded in the link. A playback system is identified, and content identified by the URL can be playing at via the local playback network (e.g., mesh network configured for home, hotel room, etc.). Parameters such as authentication, security, location, and so on can be configured for local playback of remote content.

FIG. 11 shows a flow diagram for a method 1100 to provide audio content to a local playback system. The example method 1100 of FIG. 11 provides a “throw it over the wall” approach to content delivery to a local playback system. At block 1110, a third party application provides a multimedia playback device (e.g., a Sonos™ zone player (ZP)) with enough information about content (e.g., an audio track) so that, at block 1120, the local playback system (e.g., SonosNet™) can directly access a source of the content and, at block 1130, play the content directly off the network (e.g., the Internet) or cloud.

In certain embodiments, a local playback controller application is not involved. Information passed over to the local playback device may include an identifier for a single track, a playlist, a streaming radio station, a programmed radio station, and so on. This information can also include a current play position within a list to enable near-seamless “handoff” of music from a portable device to a local playback system. Once the music information is handed from the third-party application to the local playback system, there is no further synchronization between the two systems.

A connection between the third-party application and the local playback device (e.g., Sonos ZonePlayer™) can be direct over a local area network (LAN), remote through a proxy server in the cloud, and so on. A LAN delivery

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approach may be easier to integrate into “native” applications (e.g., applications written for iOS or Android), and a proxy server approach may be easier for third party applications that are browser-based, for example.

In certain embodiments, information is provided from a third party application to a local playback system without being routed through or by a controller application. Here, the third party application is communicating with the multimedia playback device (e.g., a Sonos ZonePlayer™). Information can be passed locally, rather than through the Internet, for example. The local playback device accesses the Internet to find content to stream, and the third party application takes the place of the controller application (e.g., throw it over the wall—the application passes information and the local playback system runs it).

Certain embodiments provide an approach similar to the “throw it over the wall” or one way communication approach of FIG. 11 except that the third party application not only tells the local playback system what to play, but also maintains two-way communication with the local playback (e.g., Sonos™) system. Two-way communication helps enable features such as keeping a local playback queue synchronized with a queue that the user is editing/managing in the third party application; allow the third party application to know what is currently playing on the local playback system; allow integrated transport control between the third party application and the local playback system; and so on.

In certain embodiments, a local playback system can pass information back to a third party application to indicate a current point of playback (e.g., now playing a third song in a playlist, fourth song in the playlist, and so on). The local playback system can pass parameter information, such as a change in volume, from a local multimedia playback device to the third party application so the application can reflect the change in volume to the user via its graphical user interface. The third party application can instruct the local playback system to skip a song, go to a certain location, and so on.

Certain embodiments provide a third party mode that allows users to select from any local playback network (e.g., Sonos™) controller to listen to audio from one or more third party applications on their smartphones or tablets (e.g., Android™ devices). For example, a user may be using a local playback network controller application and now wants a third party application to appear as an audio source within the controller application. The user can then select the controller application that he or she wishes to play audio from the third party application, for example.

Certain embodiments provide queue management to allow a third party application to control a local playback queue. That is, the local playback system has a queue, but the third party application allows users to add, delete and so on from the queue, for example. Rather than switch from content that the user is currently playing, the local playback system allows a user to create a playlist on the fly. For example, if last.fm users vote that they do not like a song and it should be skipped, then the local playback system will skip it.

Certain embodiments allow a third party application to override a local playback queue with its own application-specific queue. The local playback system periodically fetches a short list of tracks to play next. The list of tracks to play is determined by the third-party application, for example. In certain embodiments, a shared queue is provided between the local playback system and the third party application to keep the local system and application synchronized.

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Certain embodiments allow control of playback system functions and/or settings via an external (e.g., third party) application. For example, a local playback system can allow volume control, play/pause, and so on and can interact with an application running on a given platform/operating system (OS). Certain embodiments provide a Web API that can be used to access functionality.

Certain embodiments facilitate control of a local playback system from outside a household or other location at which the local playback network is configured. For example, a user can queue up music while away from his or her house. The application can facilitate setup and/or configuration. For example, a third party application may ask the user to enter a Sonos customer email address and password. The application can then make a request to a Sonos server in the cloud to determine the zone groups on which music can be played.

Various inventions have been described in sufficient detail with a certain degree of particularity. It is understood to those skilled in the art that the present disclosure of embodiments has been made by way of examples only and that numerous changes in the arrangement and combination of parts can be resorted without departing from the spirit and scope of the present disclosure as claimed. While the embodiments discussed herein can appear to include some limitations as to the presentation of the information units, in terms of the format and arrangement, the embodiments have applicability well beyond such embodiment, which can be appreciated by those skilled in the art. Accordingly, the scope of the present disclosure is defined by the appended claims rather than the forgoing description of embodiments.

The invention claimed is:

1. A computing device comprising:

at least one processor;

a non-transitory computer-readable medium; and

program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the computing device to perform functions comprising:

operating in a first mode in which the computing device is configured for playback of a remote playback queue provided by a cloud-based computing system associated with a cloud-based media service;

while operating in the first mode, displaying a representation of one or more playback devices in a media playback system that are each i) communicatively coupled to the computing device over a data network and ii) available to accept playback responsibility for the remote playback queue;

while displaying the representation of the one or more playback devices, receiving user input indicating a selection of at least one given playback device from the one or more playback devices;

based on receiving the user input, transmitting an instruction for the at least one given playback device to take over responsibility for playback of the remote playback queue from the computing device, wherein the instruction configures the at least one given playback device to (i) communicate with the cloud-based computing system in order to obtain data identifying a next one or more media items that are in the remote playback queue, (ii) use the obtained data to retrieve at least one media item in the remote playback queue from the cloud-based media service; and (iii) play back the retrieved at least one media item;

detecting an indication that playback responsibility for the remote playback queue has been successfully

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transferred from the computing device to the at least one given playback device; and

after detecting the indication, transitioning from i) the first mode in which the computing device is configured for playback of the remote playback queue to ii) a second mode in which the computing device is configured to control the at least one given playback device's playback of the remote playback queue and the computing device is no longer configured for playback of the remote playback queue.

2. The computing device of claim 1, wherein the instruction comprises an instruction for the cloud-based computing system associated with the media service to provide the data identifying the next one or more media items to the given playback device for use in retrieving the at least one media item from the cloud-based computing system associated with the cloud-based media service.

3. The computing device of claim 1, wherein the instruction comprises an instruction for the cloud-based computing system associated with the cloud-based media service to provide the at least one media item to the given playback device.

4. The computing device of claim 1, wherein the representation of the one or more playback devices comprises at least one selectable indicator for a group of playback devices that includes the given playback device and one or more other playback devices that are to be configured for synchronous playback of the remote playback queue, and wherein the user input indicating the selection of at least one given playback device from the one or more playback devices comprises user input indicating a selection of the group of playback devices.

5. The computing device of claim 1, wherein operating in a first mode in which the computing device is configured for playback of the remote playback queue comprises operating in the first mode in which the computing device has received user input indicating a selection of the remote playback queue for playback by the computing device but the computing device has not yet begun playback of the remote playback queue.

6. The computing device of claim 1, further comprising program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the computing device to perform functions comprising:

beginning to operate in the first mode after i) launching a media application associated with the cloud-based media service and ii) receiving user input indicating a selection of the remote playback queue.

7. The computing device of claim 1, wherein:

operating in the first mode further involves providing a control interface comprising one or more selectable control icons that are configured to control playback of the remote playback queue by the computing device;

transitioning from the first mode to the second mode further involves modifying the control interface such that the one or more selectable control icons are configured to control playback of the remote playback queue by the at least one playback device instead of the computing device.

8. The computing device of claim 7, further comprising program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the computing device to perform functions comprising:

after transitioning to the second mode, receiving user input indicating a selection of a given control icon of

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the one or more selectable control icons, wherein the given control icon corresponds to a given transport control operation; and

based on receiving the user input indicating the selection of the given control icon, causing the corresponding transport control operation to be executed by the given playback device.

9. The computing device of claim 8, wherein the transport control operation comprises one of a play operation, a pause operation, a skip forward operation, or a skip back operation.

10. The computing device of claim 1, wherein the cloud-based computing system associated with the cloud-based media service includes one or more cloud servers.

11. The computing device of claim 1, wherein displaying the representation of the one or more playback devices comprises:

displaying the representation of the one or more playback devices in response to receiving a selection of a displayed icon indicating that playback responsibility for the remote playback queue can be transferred.

12. A non-transitory computer-readable medium having stored thereon program instructions that, when executed by at least one processor, cause a computing device to perform functions comprising:

operating in a first mode in which the computing device is configured for playback of a remote playback queue provided by a cloud-based computing system associated with a cloud-based media service;

while operating in the first mode, displaying a representation of one or more playback devices in a media playback system that are each i) communicatively coupled to the computing device over a data network and ii) available to accept playback responsibility for the remote playback queue;

while displaying the representation of the one or more playback devices, receiving user input indicating a selection of at least one given playback device from the one or more playback devices;

based on receiving the user input, transmitting an instruction for the at least one given playback device to take over responsibility for playback of the remote playback queue from the computing device, wherein the instruction configures the at least one given playback device to (i) communicate with the cloud-based computing system in order to obtain data identifying a next one or more media items that are in the remote playback queue, (ii) use the obtained data to retrieve at least one media item in the remote playback queue from the cloud-based media service; and (iii) play back the retrieved at least one media item;

detecting an indication that playback responsibility for the remote playback queue has been successfully transferred from the computing device to the at least one given playback device; and

after detecting the indication, transitioning from i) the first mode in which the computing device is configured for playback of the remote playback queue to ii) a second mode in which the computing device is configured to control the at least one given playback device's playback of the remote playback queue and the computing device is no longer configured for playback of the remote playback queue.

13. The non-transitory computer-readable medium of claim 12, wherein the instruction comprises an instruction

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for the cloud-based computing system associated with the cloud-based media service to provide the data identifying the next one or more media items to the given playback device for use in obtaining the at least one media item from the cloud-based computing system associated with the cloud-based media service.

14. The non-transitory computer-readable medium of claim 12, wherein the instruction comprises an instruction for the cloud-based computing system associated with the media service to provide the at least one media item to the given playback device.

15. A method carried out by a computing device, the method comprising:

operating in a first mode in which the computing device is configured for playback of a remote playback queue provided by a cloud-based computing system associated with a cloud-based media service;

while operating in the first mode, displaying a representation of one or more playback devices in a media playback system that are each i) communicatively coupled to the computing device over a data network and ii) available to accept playback responsibility for the remote playback queue;

while displaying the representation of the one or more playback devices, receiving user input indicating a selection of at least one given playback device from the one or more playback devices;

based on receiving the user input, transmitting an instruction for the at least one given playback device to take over responsibility for playback of the remote playback queue from the computing device, wherein the instruction configures the at least one given playback device to (i) communicate with the cloud-based computing system in order to obtain data identifying a next one or more media items that are in the remote playback queue, (ii) use the obtained data to retrieve at least one media item in the remote playback queue from the cloud-based media service; and (iii) play back the retrieved at least one media item;

detecting an indication that playback responsibility for the remote playback queue has been successfully transferred from the computing device to the at least one given playback device; and

after detecting the indication, transitioning from i) the first mode in which the computing device is configured for playback of the remote playback queue to ii) a second mode in which the computing device is configured to control the at least one given playback device's playback of the remote playback queue and the computing device is no longer configured for playback of the remote playback queue.

16. The computing device of claim 1, further comprising program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the computing device to perform functions comprising:

before displaying the representation of the one or more playback devices, receiving an indication that the one or more playback devices in the media playback system are available to accept playback responsibility for the remote playback queue.

* * * * *

EXHIBIT 3



US009344206B2

(12) **United States Patent**
Lambourne

(10) **Patent No.:** **US 9,344,206 B2**
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(54) **METHOD AND APPARATUS FOR UPDATING
ZONE CONFIGURATIONS IN A MULTI-ZONE
SYSTEM**

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H03G 7/00; H03G 1/02; G06F 3/16; G06F
3/165; G06F 3/0482; G06F 3/04842; H04N
21/43615

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USPC 700/94; 381/120, 80; 715/716, 727
See application file for complete search history.

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(73) Assignee: **Sonos, Inc.**, Santa Barbara, CA (US)

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(*) Notice: Subject to any disclaimer, the term of this
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U.S.C. 154(b) by 0 days.

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Related U.S. Application Data

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(63) Continuation of application No. 13/896,829, filed on
May 17, 2013, which is a continuation of application
No. 11/853,790, filed on Sep. 11, 2007, now Pat. No.
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Dynaudio Air series speakers; copyright and available for sale at least
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12, 2006.

Primary Examiner — Paul McCord

(74) *Attorney, Agent, or Firm* — McDonnell, Boehnen,
Hulbert & Berghoff LLP

(51) **Int. Cl.**
G06F 17/00 (2006.01)
H04H 60/80 (2008.01)
(Continued)

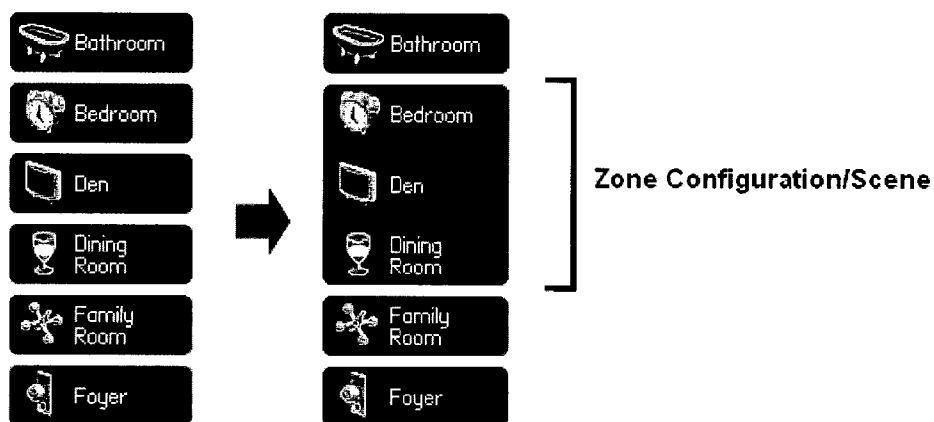
(57) **ABSTRACT**

In general, techniques of controlling a plurality of multimedia
players in groups are disclosed. According to one aspect of
the present invention, a mechanism is provided to allow a user
to group some of the players according to a theme or scene,
where each of the players is located in a zone. When the scene
is activated, the players in the scene react in a synchronized
manner. For example, the players in the scene are all caused to
play a multimedia source or music in a playlist, wherein the
multimedia source may be located anywhere on a network.

(52) **U.S. Cl.**
CPC **H04H 60/80** (2013.01); **G05B 15/02**
(2013.01); **G06F 3/0482** (2013.01); **G06F**
3/04842 (2013.01); **G06F 3/16** (2013.01);
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(58) **Field of Classification Search**
CPC H04H 60/80; H05B 15/02; H04R 3/12;

20 Claims, 11 Drawing Sheets



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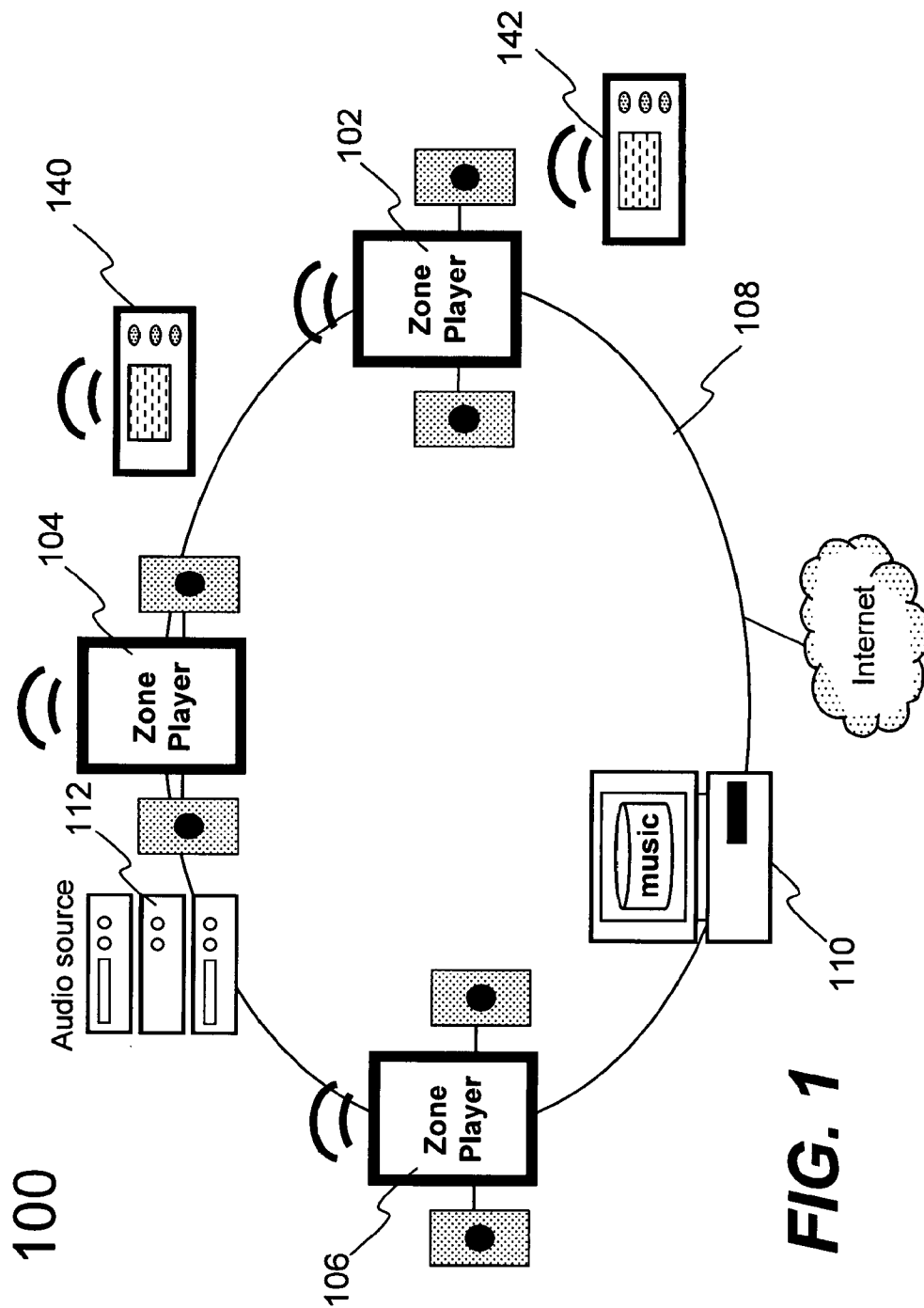
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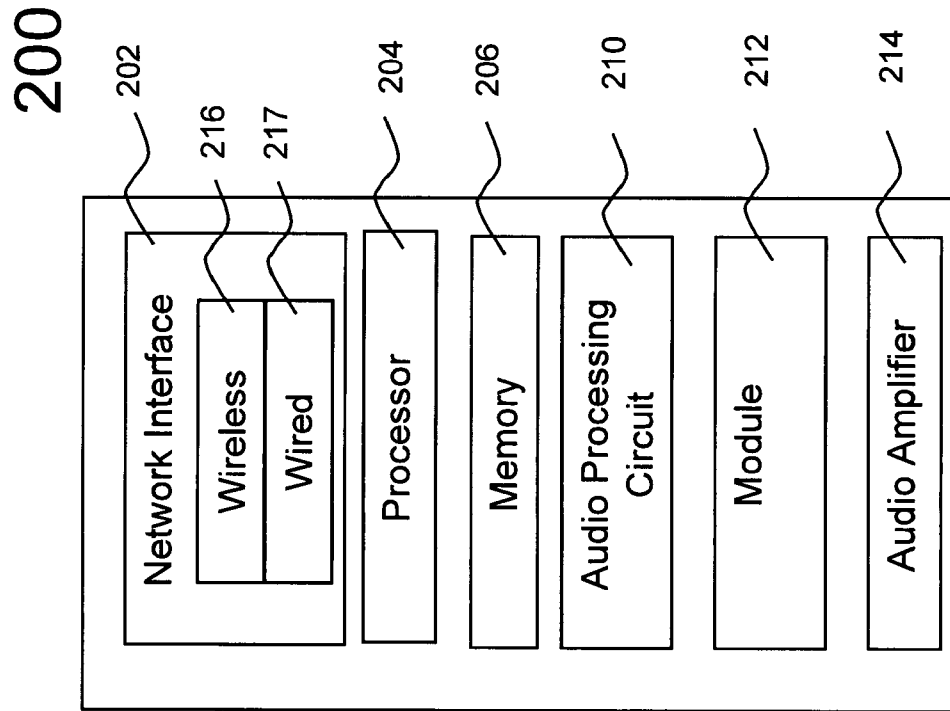


FIG. 2A

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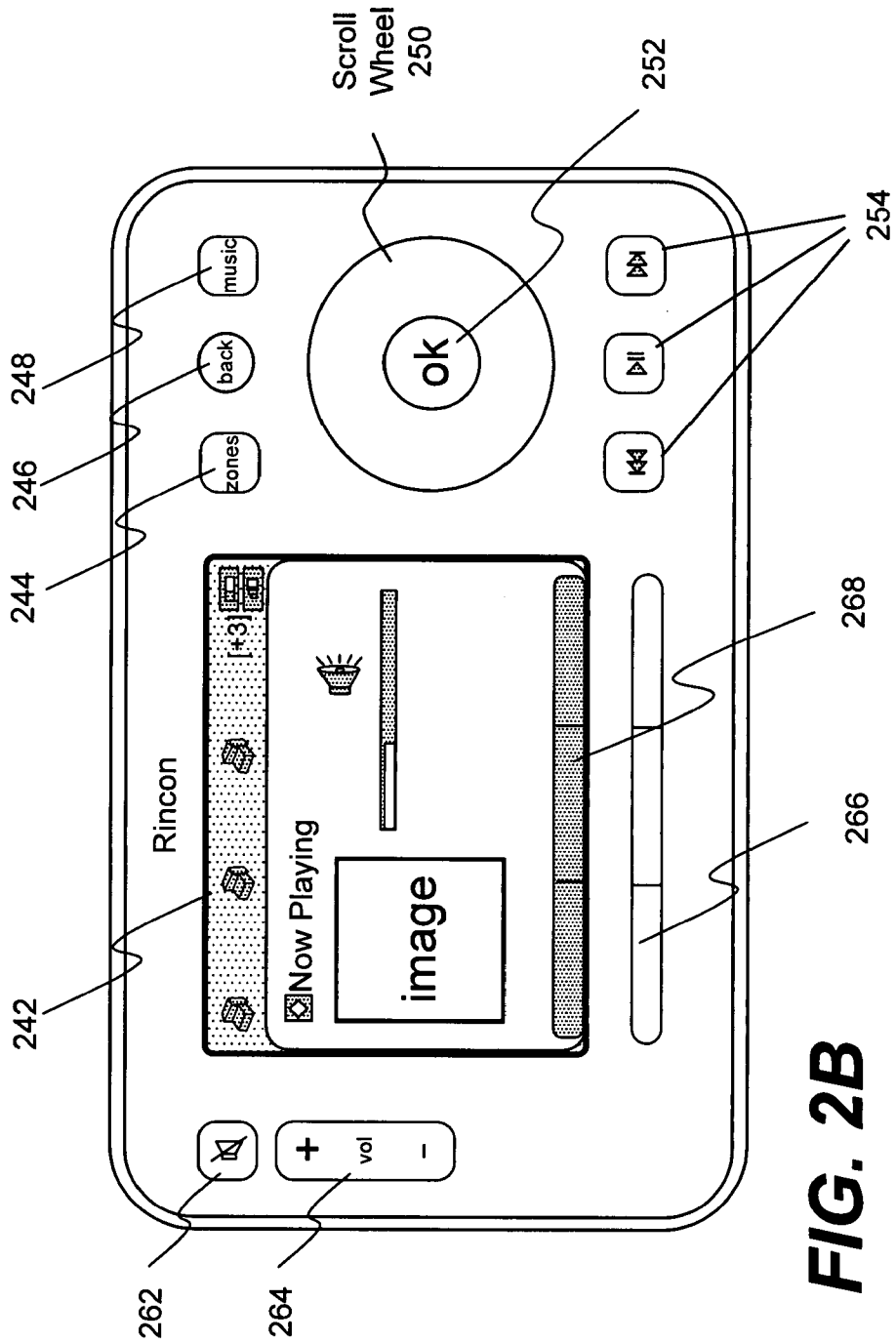


FIG. 2B

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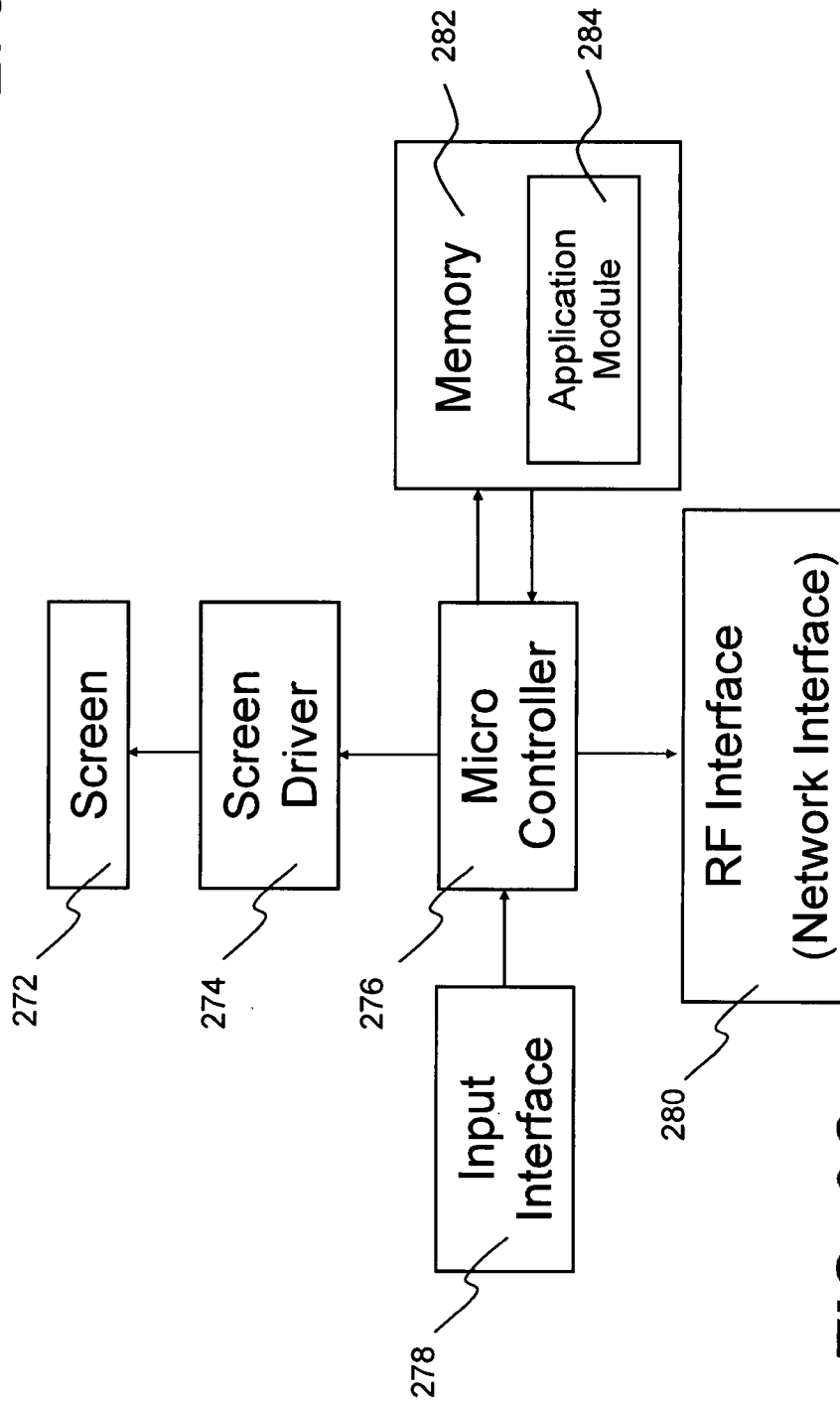


FIG. 2C

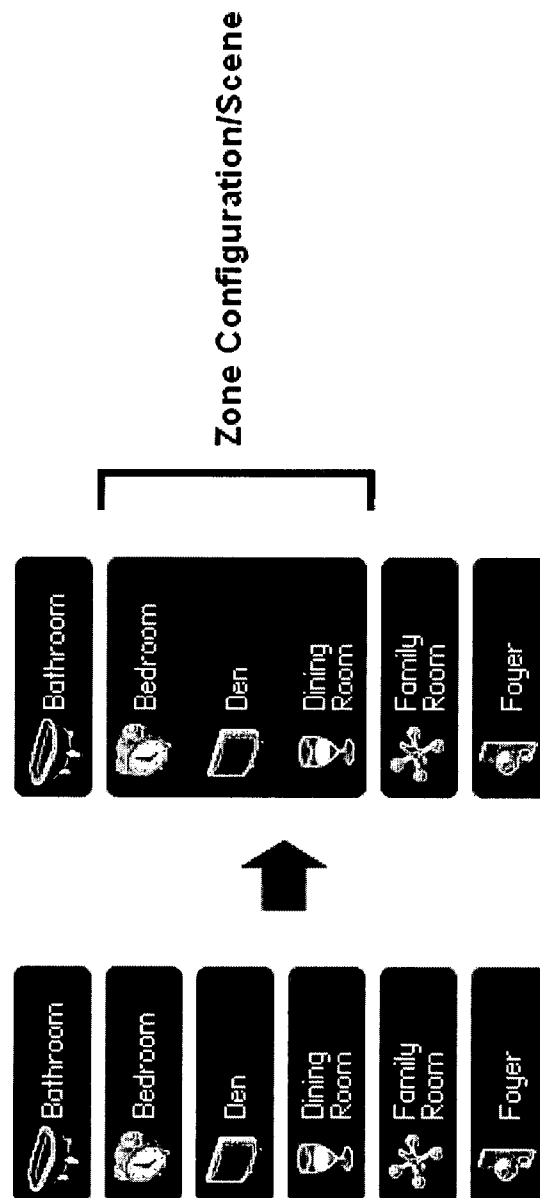


FIG. 3A

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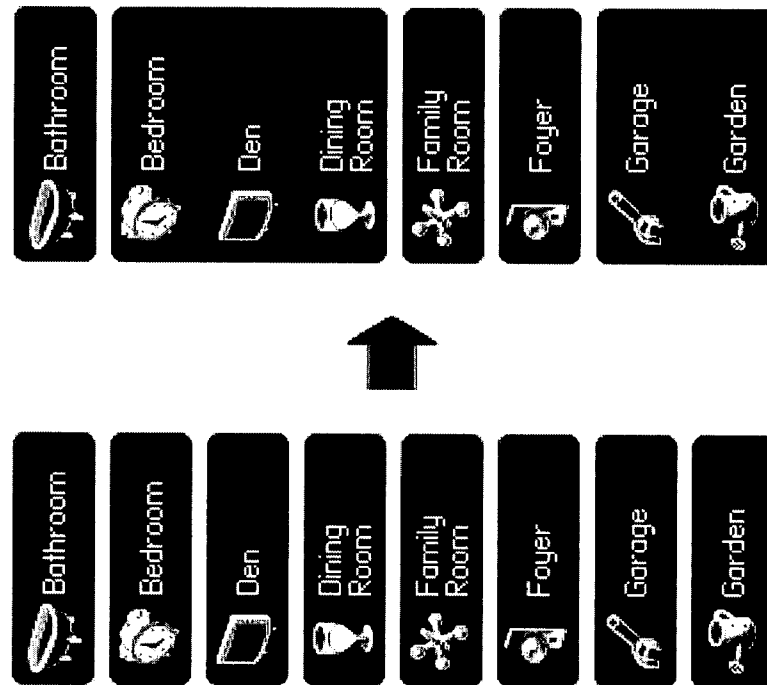
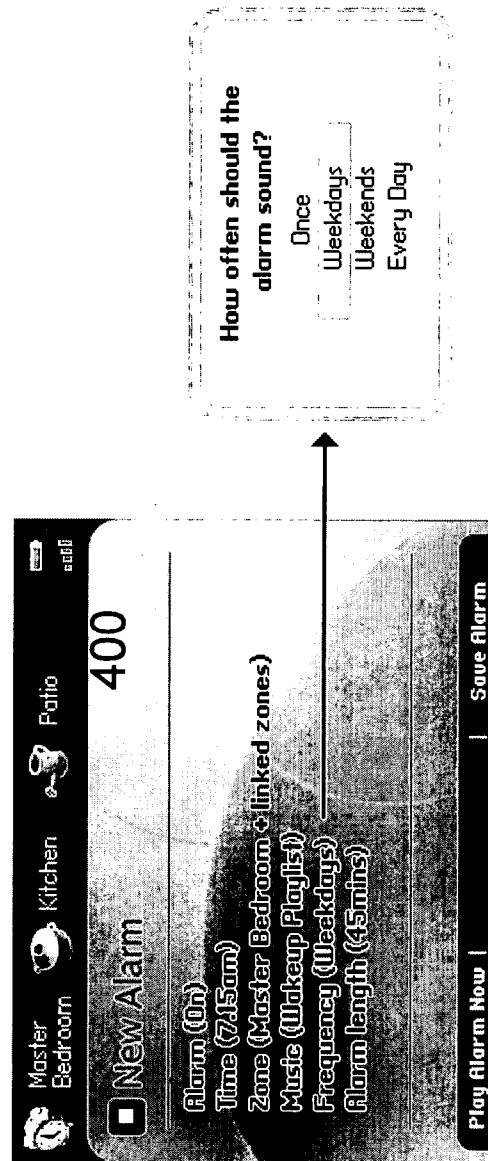


FIG. 3B



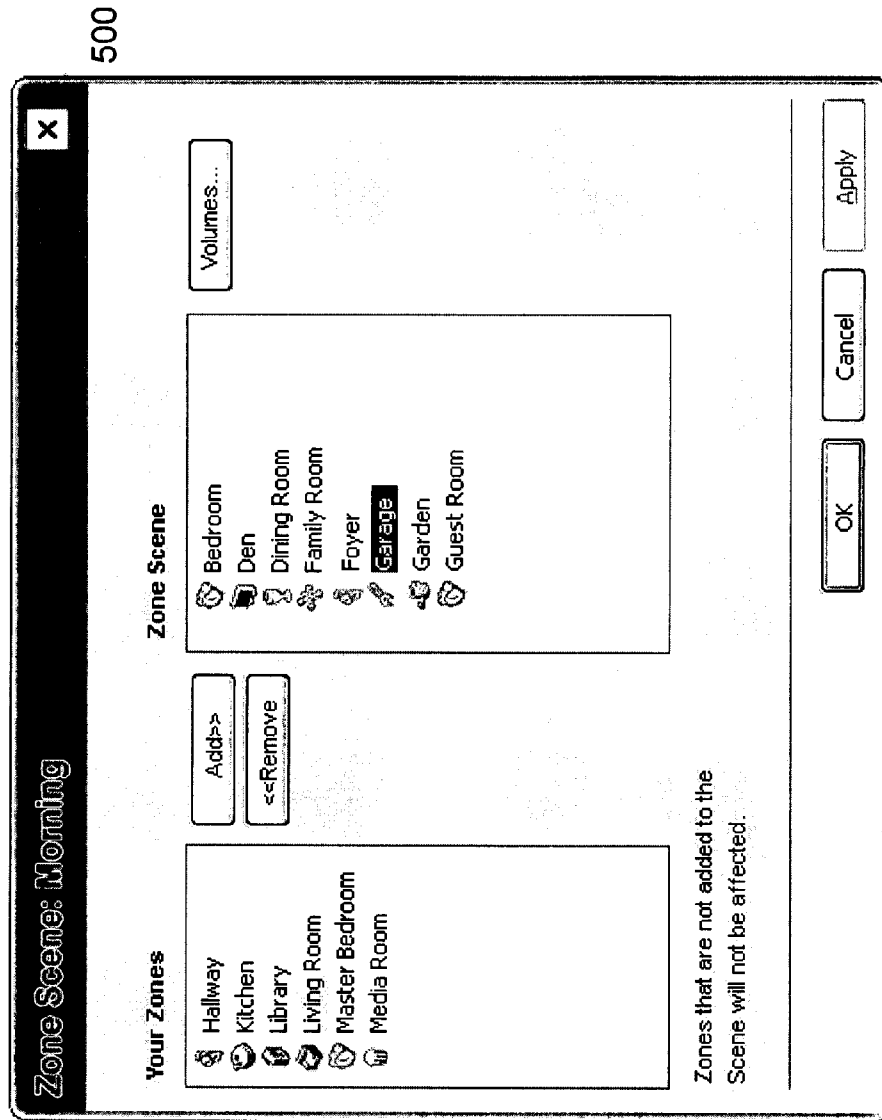


FIG. 5A

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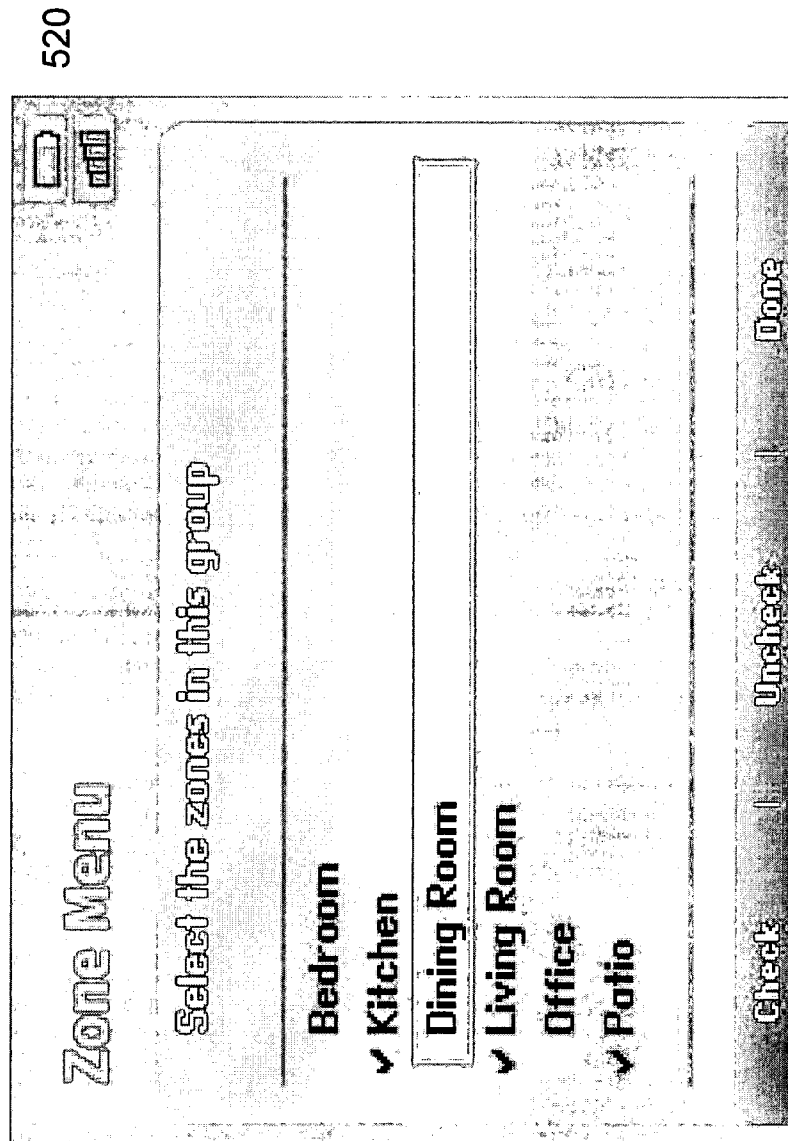


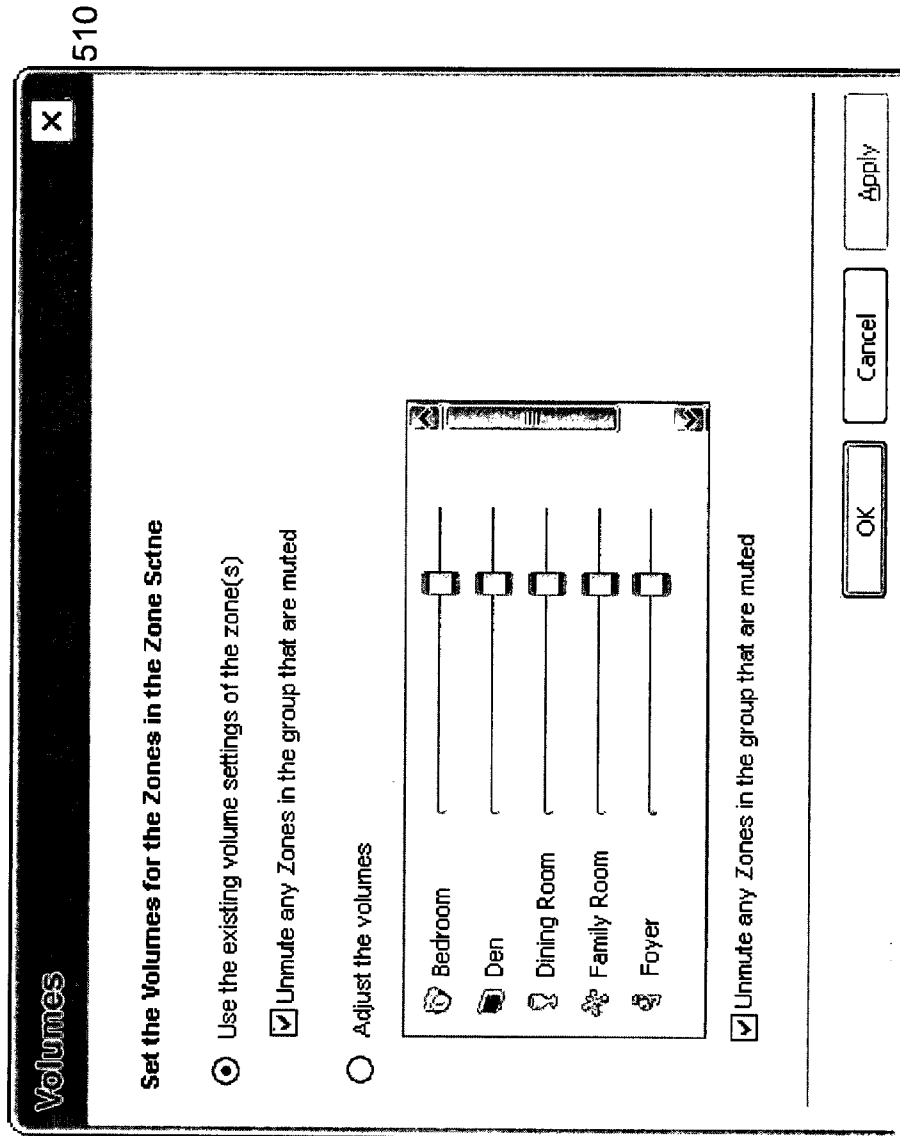
FIG. 5B

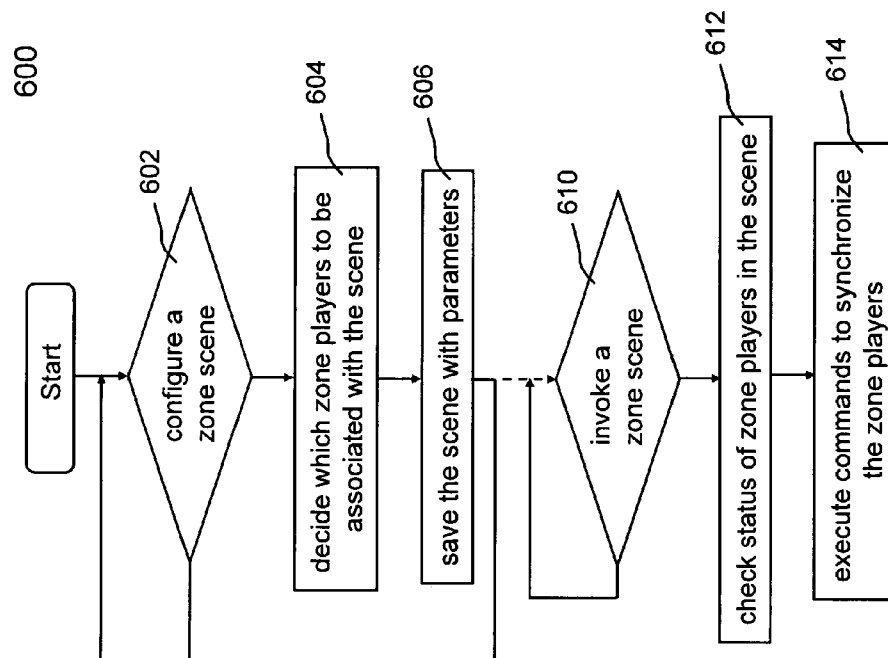
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**FIG. 5C**

**FIG. 6**

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METHOD AND APPARATUS FOR UPDATING ZONE CONFIGURATIONS IN A MULTI-ZONE SYSTEM

CROSS REFERENCE TO RELATED APPLICATION

This application is a continuation of and claims priority to U.S. patent application Ser. No. 13/896,829, filed on May 17, 2013, entitled "METHOD AND APPARATUS FOR UPDATING ZONE CONFIGURATIONS IN A MULTI-ZONE SYSTEM" and to U.S. patent application Ser. No. 11/853,790, filed Sep. 11, 2007, entitled "CONTROLLING AND MANIPULATING GROUPINGS IN A MULTI-ZONE MEDIA SYSTEM," and U.S. Provisional Application No. 60/825,407 filed on Sep. 12, 2006, entitled "CONTROLLING AND MANIPULATING GROUPINGS IN A MULTI-ZONE MEDIA SYSTEM," each of which is hereby incorporated by reference in its entirety for all purposes.

BACKGROUND OF THE INVENTION

Field of the Invention

The invention is generally related to the area of consumer electronics and human-computer interaction. In particular, the invention is related to method and apparatus for controlling or manipulating a plurality of multimedia players in a multi-zone system.

An enduring passion for quality audio reproduction or system is continuing to drive demands from users. One of the demands includes an audio system in a house in which, for example, one could grill to classic rock on a patio while another one may cook up his/her own music selections in a kitchen. This is all at the same time while a teenager catches a ballgame in a family room, and another one blasts pop in a bedroom. And the best part of such audio system is that each family member does not need his or her own stereo system—one system gives everyone access to all the music sources.

Currently, one of the systems that can meet part of such demand is a conventional multi-zone audio system that usually includes a number of audio players. Each of the audio players has its own amplifier(s) and a set of speakers and typically installed in one place (e.g., a room). In order to play an audio source at one location, the audio source must be provided locally or from a centralized location. When the audio source is provided locally, the multi-zone audio system functions as a collection of many stereo systems, making source sharing difficult. When the audio source is provided centrally, the centralized location may include a juke box, many compact discs, an AM or FM radio, tapes, or others. To send an audio source to an audio player demanding such source, a cross-bar type of device is used to prevent the audio source from going to other audio players that may be playing other audio sources.

In order to achieve playing different audio sources in different audio players, the traditional multi-zone audio system is generally either hard-wired or controlled by a pre-configured and pre-programmed controller. While the pre-programmed configuration may be satisfactory in one situation, it may not be suitable for another situation. For example, a person would like to listen to broadcast news from his/her favorite radio station in a bedroom, a bathroom and a den while preparing to go to work in the morning. The same person may wish to listen in the den and the living room to music from a compact disc in the evening. In order to satisfy such requirements, two groups of audio players must be

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established. In the morning, the audio players in the bedroom, the bathroom and the den need to be grouped for the broadcast news. In the evening, the audio players in the den and the living room are grouped for the music. Over the weekend, the audio players in the den, the living room, and a kitchen are grouped for party music. Because the morning group, the evening group and the weekend group contain the den, it can be difficult for the traditional system to accommodate the requirement of dynamically managing the ad hoc creation and deletion of groups.

There is a need for dynamic control of the audio players as a group. With a minimum manipulation, the audio players may be readily grouped. In a traditional multi-zone audio system, the audio players have to be adjusted one at a time, resulting in an inconvenient and non-homogenous audio environment. Further, there is a need to individually or systematically adjust the audio volume of the audio players.

SUMMARY OF THE INVENTION

This section is for the purpose of summarizing some aspects of the present invention and to briefly introduce some preferred embodiments. Simplifications or omissions in this section as well as in the abstract or the title of this description may be made to avoid obscuring the purpose of this section, the abstract and the title. Such simplifications or omissions are not intended to limit the scope of the present invention.

In general, the present invention pertains to controlling a plurality of multimedia players, or simply players, in groups. According to one aspect of the present invention, a mechanism is provided to allow a user to group some of the players according to a theme or scene, where each of the players is located in a zone. When the scene is activated, the players in the scene react in a synchronized manner. For example, the players in the scene are all caused to play an audio source or music in a playlist, wherein the audio source may be located anywhere on a network.

According to another aspect of the present invention, the scene may be activated at any time or a specific time. A user may activate the scene at any time so that only some selected zones in an entertainment system facilitate a playback of an audio source. When the scene is activated at a specific time, the scene may be used as an alarm or buzzer.

According to still another aspect of the present invention, a controlling device (also referred to herein as controller) is provided to facilitate a user to select any of the players in the system to form respective groups each of which is set up per a scene. Although various scenes may be saved in any of the members in a group, commands are preferably sent from the controller to the rest of the members when one of the scenes is executed. Depending on implementation, the commands include parameters pertaining to identifiers of the players, volumes settings, audio source and etc.

According to yet another aspect of the present invention, a configurable module is implemented in the controlling device that provides interactive graphic user interface for forming, managing and controlling groups in the system, de-grouping a group or adjusting audio volume of individual players or a group of players.

The present invention may be implemented in many forms including software, hardware or a combination of both. According to one embodiment, the present invention is directed to a method for groupings in a multi-zone media system, the method comprises providing a mechanism to allow a user to determine which players in the system to be associated with a theme representing a group; and configuring the theme with parameters pertaining to the players,

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wherein the theme is activated at anytime or a specific time so that the players react in a synchronized manner. The players in a scene are synchronized to play a multimedia file when the scene is activated.

According to another embodiment, the present invention is directed to an entertainment system for grouping players, the system comprises: a plurality of players, each located in one zone; and a controller providing a mechanism to allow a user to select which of the players to be associated with a theme representing a group; and configure the theme with parameters pertaining to the selected players, wherein the theme is activated at anytime or a specific time so that the selected players react in a synchronized manner. As a result, the selected players are synchronized to play a multimedia that is in a digital format and retrieved from a source over a network.

One of the objects, features, and advantages of the present invention is to remotely control a plurality of multimedia players in a multi-zone system, playing and controlling the audio source synchronously if the players are grouped together, or playing and controlling the audio source individually if the players are disassociated with each other.

Other objects, features, and advantages of the present invention will become apparent upon examining the following detailed description of an embodiment thereof, taken in conjunction with the attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features, aspects, and advantages of the present invention will become better understood with regard to the following description, appended claims, and accompanying drawings where:

FIG. 1 shows an exemplary configuration in which the present invention may be practiced;

FIG. 2A shows an exemplary functional block diagram of a player in accordance with the present invention;

FIG. 2B shows an example of a controller that may be used to remotely control one of more players of FIG. 2A;

FIG. 2C shows an exemplary internal functional block diagram of a controller in accordance with one embodiment of the present invention;

FIG. 3A provides an illustration of one zone scene, where the left column shows the starting zone grouping—all zones are separate, the column on the right shows the effects of grouping the zones to make a group of 3 zones named after “Morning”;

FIG. 3B shows that a user defines multiple groups to be gathered at the same time;

FIG. 4 shows an exemplary user interface that may be displayed on a controller or a computer of FIG. 1;

FIG. 5A shows a user interface to allow a user to form a scene;

FIG. 5B shows another user interface 520 to allow a user to form a scene;

FIG. 5C shows a user interface to allow a user to adjust a volume level of the zone players in a zone scene individually or collectively; and

FIG. 6 shows a flowchart or process of providing a player theme or a zone scene for a plurality of players, where one or more of the players are placed in a zone.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The detailed description of the invention is presented largely in terms of procedures in terms of procedures, steps, logic blocks, processing, and other symbolic representations

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that directly or indirectly resemble the operations of data processing devices coupled to networks. These process descriptions and representations are typically used by those skilled in the art to most effectively convey the substance of their work to others skilled in the art. Numerous specific details are set forth in order to provide a thorough understanding of the present invention. However, it will become obvious to those skilled in the art that the present invention may be practiced without these specific details. In other instances, well known methods, procedures, components, and circuitry have not been described in detail to avoid unnecessarily obscuring aspects of the present invention.

Reference herein to “one embodiment” or “an embodiment” means that a particular feature, structure, or characteristic described in connection with the embodiment can be included in at least one embodiment of the invention. The appearances of the phrase “in one embodiment” in various places in the specification are not necessarily all referring to the same embodiment, nor are separate or alternative embodiments mutually exclusive of other embodiments. Further, the order of blocks in process flowcharts or diagrams representing one or more embodiments of the invention do not inherently indicate any particular order nor imply any limitations in the invention.

Referring now to the drawings, in which like numerals refer to like parts throughout the several views. FIG. 1 shows an exemplary configuration 100 in which the present invention may be practiced. The configuration may represent, but not be limited to, a part of a residential home, a business building or a complex with multiple zones. There are a number of multimedia players of which three examples 102, 104 and 106 are shown as audio devices. Each of the audio devices may be installed or provided in one particular area or zone and hence referred to as a zone player herein.

As used herein, unless explicitly stated otherwise, an audio source or audio sources are in digital format and can be transported or streamed over a data network. To facilitate the understanding of the present invention, it is assumed that the configuration 100 represents a home. Thus, the zone player 102 and 104 may be located in two of the bedrooms respectively while the zone player 106 may be installed in a living room. All of the zone players 102, 104 and 106 are coupled directly or indirectly to a data network 108. In addition, a computing device 110 is shown to be coupled on the network 108. In reality, any other devices such as a home gateway device, a storage device, or an MP3 player may be coupled to the network 108 as well.

The network 108 may be a wired network, a wireless network or a combination of both. In one example, all devices including the zone players 102, 104 and 106 are coupled to the network 108 by wireless means based on an industry standard such as IEEE 802.11. In yet another example, all devices including the zone players 102, 104 and 106 are part of a local area network that communicates with a wide area network (e.g., the Internet).

Many devices on the network 108 are configured to download and store audio sources. For example, the computing device 110 can download audio sources from the Internet and store the downloaded sources locally for sharing with other devices on the Internet or the network 108. The computing device 110 or any of the zone players can also be configured to receive streaming audio. Shown as a stereo system, the device 112 is configured to receive an analog audio source (e.g., from broadcasting) or retrieve a digital audio source (e.g., from a compact disk). The analog audio sources can be

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converted to digital audio sources. In accordance with the present invention, the audio source may be shared among the devices on the network **108**.

Two or more zone players may be grouped together to form a new zone group. Any combinations of zone players and an existing zone group may be grouped together. In one instance, a new zone group is formed by adding one zone player to another zone player or an existing zone group.

Referring now to FIG. 2A, there is shown an exemplary functional block diagram of a zone player **200** in accordance with the present invention. The zone player **200** includes a network interface **202**, a processor **204**, a memory **206**, an audio processing circuit **210**, a module **212**, and optionally, an audio amplifier **214** that may be internal or external. The network interface **202** facilitates a data flow between a data network (i.e., the data network **108** of FIG. 1) and the zone player **200** and typically executes a special set of rules (i.e., a protocol) to send data back and forth. One of the common protocols used in the Internet is TCP/IP (Transmission Control Protocol/Internet Protocol). In general, a network interface manages the assembling of an audio source or file into smaller packets that are transmitted over the data network or reassembles received packets into the original source or file. In addition, the network interface **202** handles the address part of each packet so that it gets to the right destination or intercepts packets destined for the zone player **200**.

The network interface **202** may include one or both of a wireless interface **216** and a wired interface **217**. The wireless interface **216**, also referred to as a RF interface, provides network interface functions by a wireless means for the zone player **200** to communicate with other devices in accordance with a communication protocol (such as the wireless standard IEEE 802.11a, 802.11b or 802.11g). The wired interface **217** provides network interface functions by a wired means (e.g., an Ethernet cable). In one embodiment, a zone player includes both of the interfaces **216** and **217**, and other zone players include only a RF or wired interface. Thus these other zone players communicate with other devices on a network or retrieve audio sources via the zone player. The processor **204** is configured to control the operation of other parts in the zone player **200**. The memory **206** may be loaded with one or more software modules that can be executed by the processor **204** to achieve desired tasks. According to one aspect of the present invention, a software module implementing one embodiment of the present invention is executed, the processor **204** operates in accordance with the software module in reference to a saved zone group configuration characterizing a zone group created by a user, the zone player **200** is caused to retrieve an audio source from another zone player or a device on the network.

According to one embodiment of the present invention, the memory **206** is used to save one or more saved zone configuration files that may be retrieved for modification at any time. Typically, a saved zone group configuration file is transmitted to a controller (e.g., the controlling device **140** or **142** of FIG. 1, a computer, a portable device, or a TV) when a user operates the controlling device. The zone group configuration provides an interactive user interface so that various manipulations or control of the zone players may be performed.

The audio processing circuit **210** resembles most of the circuitry in an audio playback device and includes one or more digital-to-analog converters (DAC), an audio preprocessing part, an audio enhancement part or a digital signal processor and others. In operation, when an audio source is retrieved via the network interface **202**, the audio source is processed in the audio processing circuit **210** to produce analog audio signals. The processed analog audio signals are

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then provided to the audio amplifier **214** for playback on speakers. In addition, the audio processing circuit **210** may include necessary circuitry to process analog signals as inputs to produce digital signals for sharing with other devices on a network.

Depending on an exact implementation, the module **212** may be implemented as a combination of hardware and software. In one embodiment, the module **212** is used to save a scene. The audio amplifier **214** is typically an analog circuit that powers the provided analog audio signals to drive one or more speakers.

Referring now to FIG. 2B, there is shown an exemplary controller **240**, which may correspond to the controlling device **140** or **142** of FIG. 1. The controller **240** may be used to facilitate the control of multi-media applications, automation and others in a complex. In particular, the controller **240** is configured to facilitate a selection of a plurality of audio sources available on the network, controlling operations of one or more zone players (e.g., the zone player **200**) through a RF interface corresponding to the RF interface **216** of FIG. 2A. According to one embodiment, the wireless means is based on an industry standard (e.g., infrared, radio, wireless standard IEEE 802.11a, 802.11b or 802.11g). When a particular audio source is being played in the zone player **200**, a picture, if there is any, associated with the audio source may be transmitted from the zone player **200** to the controller **240** for display. In one embodiment, the controller **240** is used to synchronize more than one zone players by grouping the zone players in a group. In another embodiment, the controller **240** is used to control the volume of each of the zone players in a zone group individually or together.

The user interface for the controller **240** includes a screen **242** (e.g., a LCD screen) and a set of functional buttons as follows: a "zones" button **244**, a "back" button **246**, a "music" button **248**, a scroll wheel **250**, "ok" button **252**, a set of transport control buttons **254**, a mute button **262**, a volume up/down button **264**, a set of soft buttons **266** corresponding to the labels **268** displayed on the screen **242**.

The screen **242** displays various screen menus in response to a user's selection. In one embodiment, the "zones" button **244** activates a zone management screen or "Zone Menu", which is described in more details below. The "back" button **246** may lead to different actions depending on the current screen. In one embodiment, the "back" button triggers the current screen display to go back to a previous one. In another embodiment, the "back" button negates the user's erroneous selection. The "music" button **248** activates a music menu, which allows the selection of an audio source (e.g., a song) to be added to a zone player's music queue for playback.

The scroll wheel **250** is used for selecting an item within a list, whenever a list is presented on the screen **242**. When the items in the list are too many to be accommodated in one screen display, a scroll indicator such as a scroll bar or a scroll arrow is displayed beside the list. When the scroll indicator is displayed, a user may rotate the scroll wheel **250** to either choose a displayed item or display a hidden item in the list. The "ok" button **252** is used to confirm the user selection on the screen **242**.

There are three transport buttons **254**, which are used to control the effect of the currently playing song. For example, the functions of the transport buttons may include play/pause and forward/rewind a song, move forward to a next song track, or move backward to a previous track. According to one embodiment, pressing one of the volume control buttons such as the mute button **262** or the volume up/down button **264** activates a volume panel. In addition, there are three soft buttons **266** that can be activated in accordance with the labels

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268 on the screen 242. It can be understood that, in a multi-zone system, there may be multiple audio sources being played respectively in more than one zone players. The music transport functions described herein shall apply selectively to one of the sources when a corresponding one of the zone players or zone groups is selected.

FIG. 2C illustrates an internal functional block diagram of an exemplary controller 270, which may correspond to the controller 240 of FIG. 2B. The screen 272 on the controller 270 may be a LCD screen. The screen 272 communicates with and is commanded by a screen driver 274 that is controlled by a microcontroller (e.g., a processor) 276. The memory 282 may be loaded with one or more application modules 284 that can be executed by the microcontroller 276 with or without a user input via the user interface 278 to achieve desired tasks. In one embodiment, an application module is configured to facilitate grouping a number of selected zone players into a zone group and synchronizing the zone players for one audio source. In another embodiment, an application module is configured to control together the audio volumes of the zone players in a zone group. In operation, when the microcontroller 276 executes one of the application modules 284, the screen driver 274 generates control signals to drive the screen 272 to display an application specific user interface accordingly, more of which will be described below.

The controller 270 includes a network interface 280 referred to as a RF interface 280 that facilitates wireless communication with a zone player via a corresponding RF interface thereof. In one embodiment, the commands such as volume control and audio playback synchronization are sent via the RF interfaces. In another embodiment, a saved zone group configuration is transmitted between a zone player and a controller via the RF interfaces. The controller 270 may control one or more zone players, such as 102, 104 and 106 of FIG. 1. Nevertheless, there may be more than one controllers, each preferably in a zone (e.g., a room) and configured to control any one and all of the zone players.

In one embodiment, a user creates a zone group including at least two zone players from the controller 240 that sends signals or data to one of the zone players. As all the zone players are coupled on a network, the received signals in one zone player can cause other zone players in the group to be synchronized so that all the zone players in the group playback an identical audio source or a list of identical audio sources in a timely synchronized manner. Similarly, when a user increases the audio volume of the group from the controller, the signals or data of increasing the audio volume for the group are sent to one of the zone players and causes other zone players in the group to be increased together in volume and in scale.

According to one implementation, an application module is loaded in memory 282 for zone group management. When a predetermined key (e.g. the “zones” button 244) is activated on the controller 240, the application module is executed in the microcontroller 276. The input interface 278 coupled to and controlled by the microcontroller 276 receives inputs from a user. A “Zone Menu” is then displayed on the screen 272. The user may start grouping zone players into a zone group by activating a “Link Zones” or “Add Zone” soft button, or de-grouping a zone group by activating an “Unlink Zones” or “Drop Zone” button. The detail of the zone group manipulation will be further discussed below.

As described above, the input interface 278 includes a number of function buttons as well as a screen graphical user interface. It should be pointed out that the controller 240 in FIG. 2B is not the only controlling device that may practice the present invention. Other devices that provide the equivalent

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control functions (e.g., a computing device, a hand-held device) may also be configured to practice the present invention. In the above description, unless otherwise specifically described, it is clear that keys or buttons are generally referred to as either the physical buttons or soft buttons, enabling a user to enter a command or data.

One mechanism for ‘joining’ zone players together for music playback is to link a number of zone players together to form a group. To link a number of zone players together, a user may manually link each zone player or room one after the other. For example, there is a multi-zone system that includes the following zones.

Bathroom
Bedroom
Den
Dining Room
Family Room
Foyer

If the user wishes to link 5 of the 6 zone players using the current mechanism, he/she must start with a single zone and then manually link each zone to that zone. This mechanism may be sometimes quite time consuming. According to one embodiment, a set of zones can be dynamically linked together using one command. Using what is referred to herein as a theme or a zone scene, zones can be configured in a particular scene (e.g., morning, afternoon, or garden), where a predefined zone grouping and setting of attributes for the grouping are automatically effectuated.

For instance, a “Morning” zone scene/configuration command would link the Bedroom, Den and Dining Room together in one action. Without this single command, the user would need to manually and individually link each zone. FIG. 3A provides an illustration of one zone scene, where the left column shows the starting zone grouping—all zones are separate, the column on the right shows the effects of grouping the zones to make a group of 3 zones named after “Morning”.

Expanding this idea further, a Zone Scene can be set to create multiple sets of linked zones. For example, a scene creates 3 separate groups of zones, the downstairs zones would be linked together, the upstairs zones would be linked together in their own group, and the outside zones (in this case the patio) would move into a group of its own.

In one embodiment as shown in FIG. 3B, a user defines multiple groups to be gathered at the same time. For example: an “Evening Scene” is desired to link the following zones:

Group 1
Bedroom
Den
Dining Room
Group 2
Garage
Garden

where Bathroom, Family Room and Foyer should be separated from any group if they were part of a group before the Zone Scene was invoked.

One important of the features, benefits and objects in the present invention is that that zones do not need to be separated before a zone scene is invoked. In one embodiment, a command is provided and links all zones in one step, if invoked. The command is in a form of a zone scene. After linking the appropriate zones, a zone scene command could apply the following attributes:

Set volumes levels in each zones (each zone can have a different volume) Mute/Unmute zones.
Select and play specific music in the zones.
Set the play mode of the music (Shuffle, Repeat, Shuffle-repeat)

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Set the music playback equalization of each zone (e.g., bass treble).

A further extension of this embodiment is to trigger a zone scene command as an alarm clock function. For instance the zone scene is set to apply at 8:00 am. It could link appropriate zones automatically, set specific music to play and then stop the music after a defined duration. Although a single zone may be assigned to an alarm, a scene set as an alarm clock provides a synchronized alarm, allowing any zones linked in the scene to play a predefined audio (e.g., a favorable song, a predefined playlist) at a specific time or for a specific duration. If, for any reason, the scheduled music failed to be played (e.g., an empty playlist, no connection to a share, failed UPnP, no Internet connection for an Internet Radio station), a backup buzzer will sound. This buzzer will be a sound file that is stored in a zone player.

FIG. 4 shows an exemplary user interface 400 that may be displayed on a controller 142 or a computer 110 of FIG. 1. The interface 400 shows a list of items that may be set up by a user to cause a scene to function at a specific time. In the embodiment shown in FIG. 4, the list of items includes "Alarm", "Time", "Zone", "Music", "Frequency" and "Alarm length". "Alarm" can be set on or off. When "Alarm" is set on, "Time" is a specific time to set off the alarm. "Zone" shows which zone players are being set to play a specified audio at the specific time. "Music" shows what to be played when the specific time arrives. "Frequency" allows the user to define a frequency of the alarm. "Alarm length" defines how long the audio is to be played. It should be noted that the user interface 400 is provided herein to show some of the functions associated with setting up an alarm. Depending on an exact implementation, other functions, such as time zone, daylight savings, time synchronization, and time/date format for display may also be provided without departing from the present invention.

According to one embodiment, each zone player in a scene may be set up for different alarms. For example, a "Morning" scene includes three zone players, each in a bedroom, a den, and a dining room. After selecting the scene, the user may set up an alarm for the scene as whole. As a result, each of the zone players will be activated at a specific time.

FIG. 5A shows a user interface 500 to allow a user to form a scene. The panel on the left shows the available zones in a household. The panel on the right shows the zones that have been selected and be grouped as part of this scene. Depending on an exact implementation of a user interface, Add/Remove buttons may be provided to move zones between the panels, or zones may be dragged along between panels.

FIG. 5B shows another user interface 520 to allow a user to form a scene. The user interface 520 that may be displayed on a controller or a computing device, lists available zones in a system. A checkbox is provide next to each of the zones so that a user may check in the zones to be associated with the scene.

FIG. 5C shows a user interface 510 to allow a user to adjust a volume level of the zone players in a zone scene individually or collectively. As shown in the user interface 510, the "Volumes . . ." button (shown as sliders, other forms are possible) allows the user to affect the volumes of the associated zone players when a zone scene is invoked. In one embodiment, the zone players can be set to retain whatever volume that they currently have when the scene is invoked. Additionally the user can decide if the volumes should be unmuted or muted when the scene is invoked.

FIG. 6 shows a flowchart or process 600 of providing a player theme or a zone scene for a plurality of players, where one or more of the players are placed in a zone. The process

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600 is presented in accordance with one embodiment of the present invention and may be implemented in a module to be located in the memory 282 of FIG. 2C.

The process 600 is initiated only when a user decides to proceed with a zone scene at 602. The process 600 then moves to 604 where it allows a user to decide which zone players to be associated with the scene. For example, there are ten players in a household, and the scene is named after "Morning". The user may be given an interface to select four of the ten players to be associated with the scene. At 606, the scene is saved. The scene may be saved in any one of the members in the scene. In the example of FIG. 1, the scene is saved in one of the zone players and displayed on the controller 142. In operation, a set of data pertaining to the scene includes a plurality of parameters. In one embodiment, the parameters include, but may not be limited to, identifiers (e.g., IP address) of the associated players and a playlist. The parameters may also include volume/tone settings for the associated players in the scene. The user may go back to 602 to configure another scene if desired.

Given a saved scene, a user may activate the scene at any time or set up a timer to activate the scene at 610. The process 600 can continue when a saved scene is activated at 610. At 612, upon the activation of a saved scene, the process 600 checks the status of the players associated with the scene. The status of the players means that each of the players shall be in condition to react in a synchronized manner. In one embodiment, the interconnections of the players are checked to make sure that the players communicate among themselves and/or with a controller if there is such a controller in the scene.

It is assumed that all players associated with the scene are in good condition. At 614, commands are executed with the parameters (e.g., pertaining to a playlist and volumes). In one embodiment, data including the parameters is transported from a member (e.g., a controller) to other members in the scene so that the players are caused to synchronize an operation configured in the scene. The operation may cause all players to play back a song in identical or different volumes or to play back a pre-stored file.

One of the features, benefits and advantages in the present invention is to allow sets of related devices (controllers and operating components) to exist as a group without interfering with other components that are potentially visible on the same wired or wireless network. Each of the sets is configured to a theme or a scene.

The present invention has been described in sufficient detail with a certain degree of particularity. It is understood to those skilled in the art that the present disclosure of embodiments has been made by way of examples only and that numerous changes in the arrangement and combination of parts may be resorted without departing from the spirit and scope of the invention as claimed. While the embodiments discussed herein may appear to include some limitations as to the presentation of the information units, in terms of the format and arrangement, the invention has applicability well beyond such embodiment, which can be appreciated by those skilled in the art. Accordingly, the scope of the present invention is defined by the appended claims rather than the foregoing description of embodiments.

The invention claimed is:

1. A multimedia controller including a processor, the controller configured to:

receive, via a network interface, a zone configuration from a first independent playback device of a plurality of independent playback devices, wherein the zone configuration is configured via the controller and maintained at the first independent playback device, and

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wherein the zone configuration characterizes one or more zone scenes, each zone scene identifying a group configuration associated with two or more of the plurality of independent playback devices; and

cause a selectable indication of the received zone configuration to be displayed, wherein the displayed selectable indication is selectable to cause one or more of the zone scenes to be invoked by two or more of the plurality of independent playback devices.

2. The multimedia controller of claim 1, wherein causing the selectable indication of the received zone configuration to be displayed comprises causing an indication of at least one of the one or more zone scenes to be displayed.

3. The multimedia controller of claim 2, wherein causing the selectable indication of the at least one of the one or more zone scenes to be displayed comprises displaying an indication of the group configuration identified by the at least one of the one or more zone scenes to be displayed.

4. The multimedia controller of claim 3, wherein the indication of the group configuration identified by the at least one of the one or more zone scenes comprises one group of independent playback devices.

5. The multimedia controller of claim 4, further configured to:

after causing the indication of the received zone configuration to be displayed, cause one of the at least one of the one or more zone scenes to be activated.

6. The multimedia controller of claim 3, wherein the indication of the group configuration identified by the at least one of the one or more zone scenes comprises two or more groups of independent playback devices.

7. The multimedia controller claim 1, further configured to: before receiving the zone configuration, send, to one of the plurality of independent playback devices, a command to save at least one of the one or more zone scenes.

8. The multimedia controller of claim 7, wherein the command to save at least one of the one or more zone scenes includes, for each of the at least one or more zone scenes, (a) an indication of the two or more of the plurality of independent playback devices identified by the zone scene and (b) at least one other parameter pertaining to the scene.

9. The multimedia controller of claim 8, wherein the at least one other parameter pertaining to the scene is one or more of (i) a volume level, (ii) a specific music, (iii) a play mode, or (iv) an equalization.

10. The multimedia controller of claim 1, further configured to:

after causing the selectable indication of the received zone configuration to be displayed, cause at least one of the one or more zone scenes to be activated.

11. The multimedia controller of claim 1, wherein each of the one or more zone scenes is associated with a name.

12. In a network comprising a plurality of independent playback devices, a method comprising:

receiving, via the network by a controller device, a zone configuration from a first independent playback device of a plurality of independent playback devices, wherein the zone configuration is configured via the controller and maintained at the first independent playback device,

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and wherein the zone configuration characterizes one or more zone scenes, each zone scene identifying a group configuration associated with two or more of the plurality of independent playback devices; and

causing, by the controller device, a selectable indication of the received zone configuration to be displayed, wherein the displayed selectable indication is selectable to cause one or more of the zone scenes to be invoked by two or more of the plurality of independent playback devices.

13. The method of claim 12, wherein causing the selectable indication of the received zone configuration to be displayed comprises causing an indication of at least one of the one or more zone scenes to be displayed.

14. The method of claim 13, wherein causing the selectable indication of the at least one of the one or more zone scenes to be displayed comprises displaying an indication of the group configuration identified by the at least one of the one or more zone scenes to be displayed.

15. The method of claim 12, further comprising:

before receiving the zone configuration, sending, to one of the plurality of independent playback devices, a command to save at least one of the one or more zone scenes.

16. The method of claim 12, further comprising:

after causing the selectable indication of the received zone configuration to be displayed, causing, by the controller device, at least one of the one or more zone scenes to be activated.

17. A non-transitory computer-readable storage medium including a set of instructions for execution by a processor, the set of instructions, when executed, implement a controller configured to:

receive, via a network interface, a zone configuration from a first independent playback device of a plurality of independent playback devices, wherein the zone configuration is configured via the controller and maintained at the first independent playback device, and wherein the zone configuration characterizes one or more zone scenes, each zone scene identifying a group configuration associated with two or more of the plurality of independent playback devices; and

cause a selectable indication of the received zone configuration to be displayed, wherein the displayed selectable indication is selectable to cause one or more of the zone scenes to be invoked by two or more of the plurality of independent playback devices.

18. The computer-readable medium of claim 17, wherein causing the selectable indication of the received zone configuration to be displayed comprises causing an indication of at least one of the one or more zone scenes to be displayed.

19. The computer readable medium of claim 17, wherein causing the selectable indication of the at least one of the one or more zone scenes to be displayed comprises displaying an indication of the group configuration identified by the at least one of the one or more zone scenes to be displayed.

20. The computer readable medium of claim 19, wherein the indication of the group configuration identified by the at least one of the one or more zone scenes comprises two or more groups of independent playback devices.

* * * * *

EXHIBIT 4

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(12) **United States Patent**
Lambourne

(10) **Patent No.:** **US 10,469,966 B2**
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(54) **ZONE SCENE MANAGEMENT**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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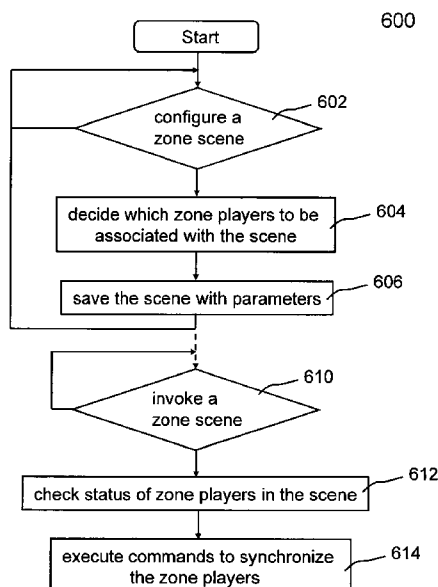
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CPC H04R 27/00; H04R 3/12; H04R 2227/005;
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(57) **ABSTRACT**

An example computing device in a media playback system receives a first request to create a first zone scene including a first preconfigured grouping of zones including a first zone and a second zone, and based on the first request, causes creation and storage of the first zone scene. The computing device receives a second request to create a second zone scene including a second preconfigured grouping of zones including the first zone and a third zone, and based on the second request, causes creation and storage of the second zone scene. While displaying a representation of the first zone scene and a representation of the second zone scene, the computing devices receives a third request to invoke the first zone scene, and based on the third request, causes the first zone scene to be invoked such that the first zone and the second zone become configured for synchronous playback of media.

20 Claims, 13 Drawing Sheets



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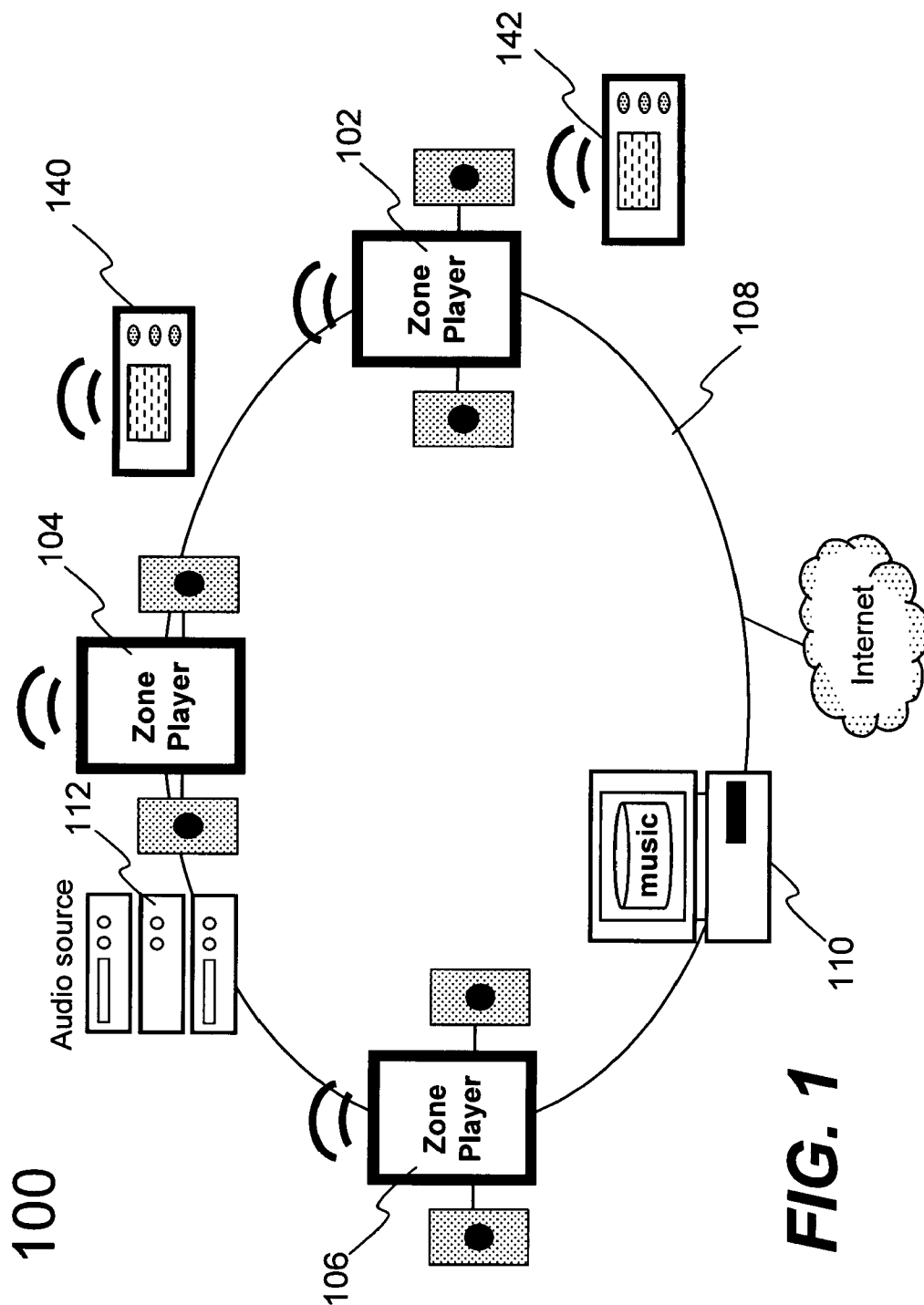
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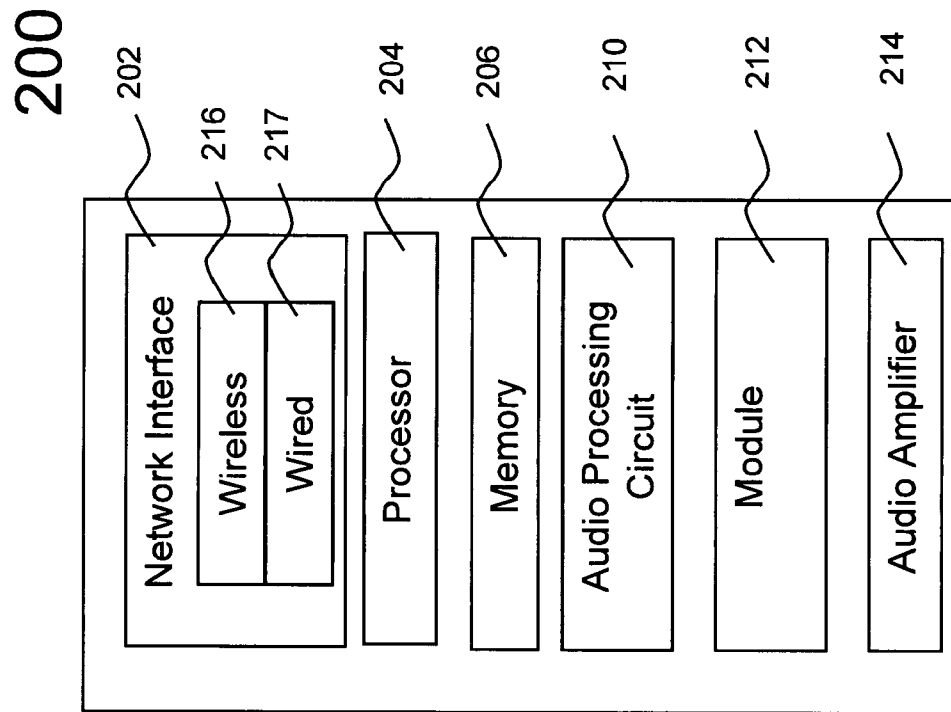


FIG. 2A

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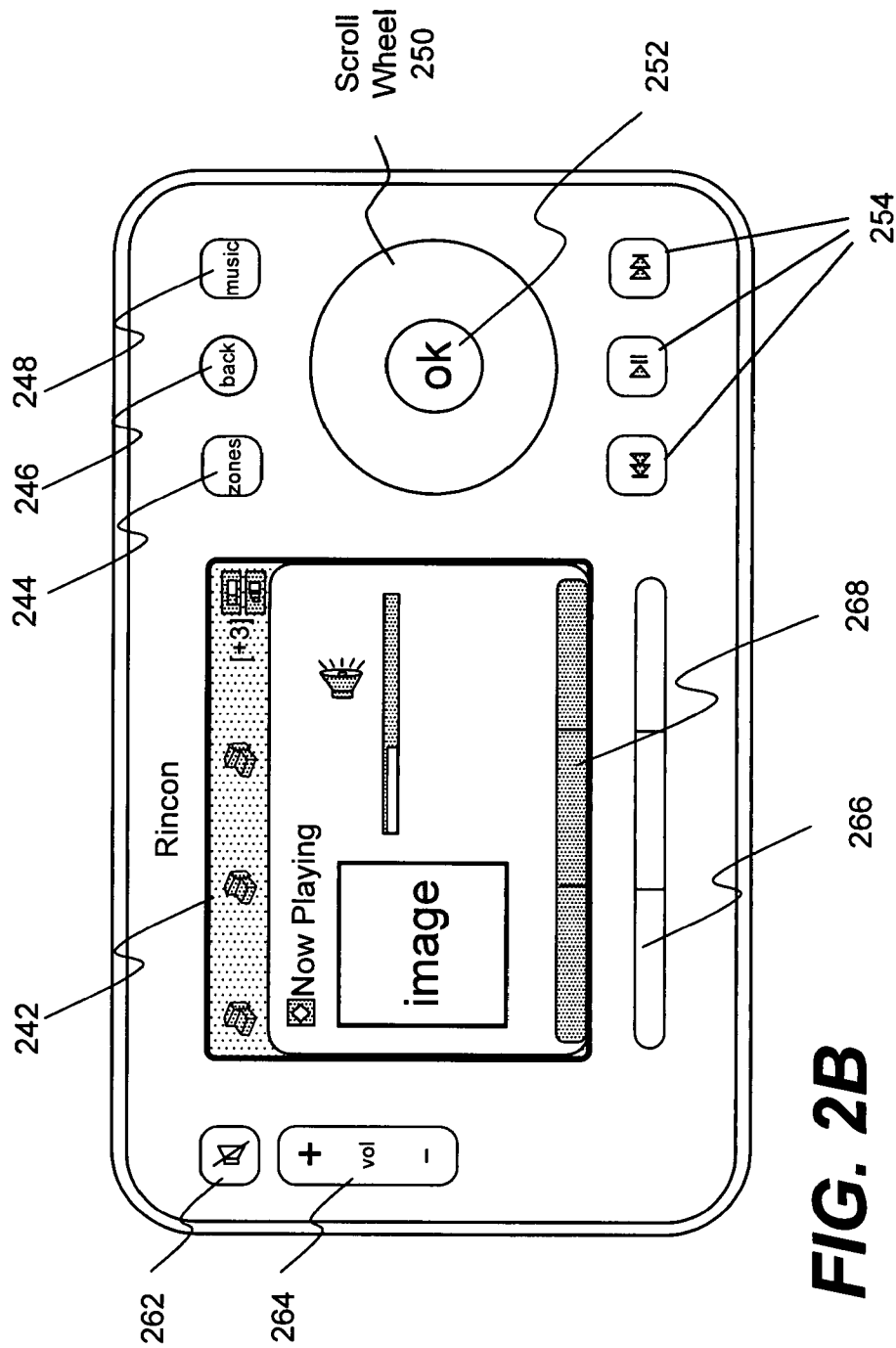


FIG. 2B

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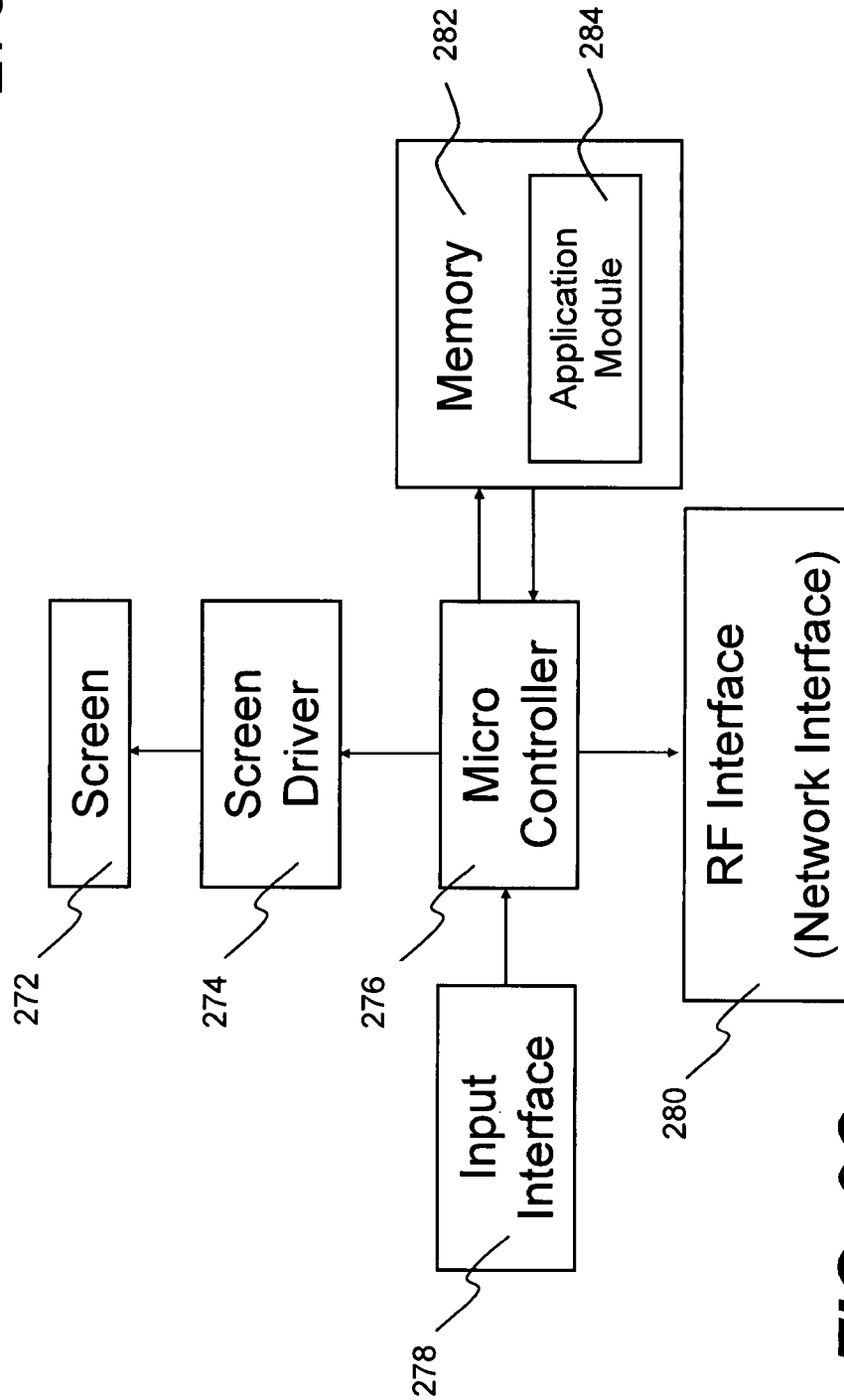


FIG. 2C

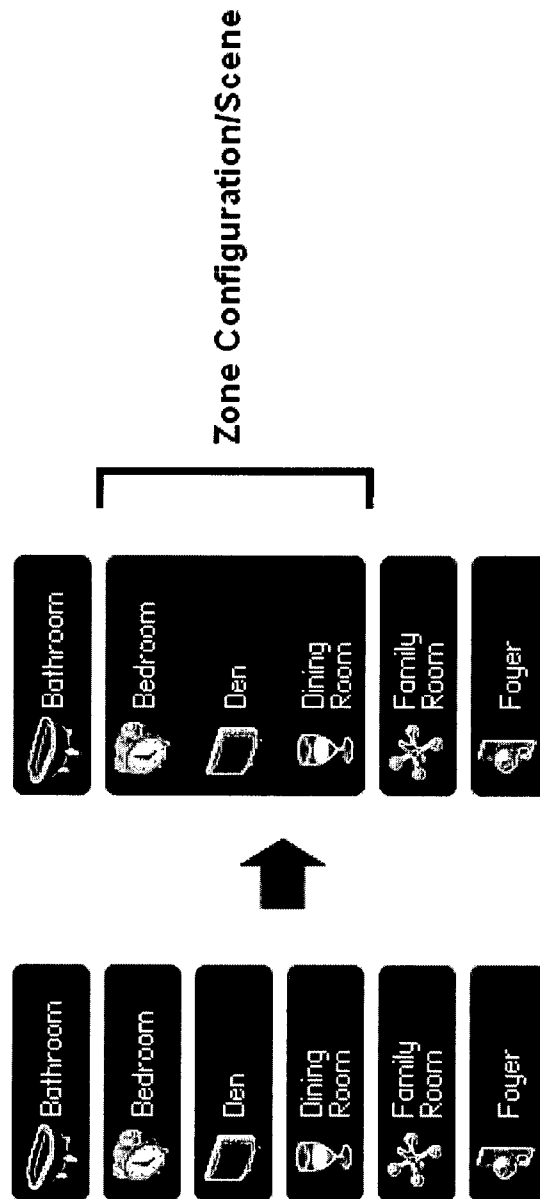


FIG. 3A

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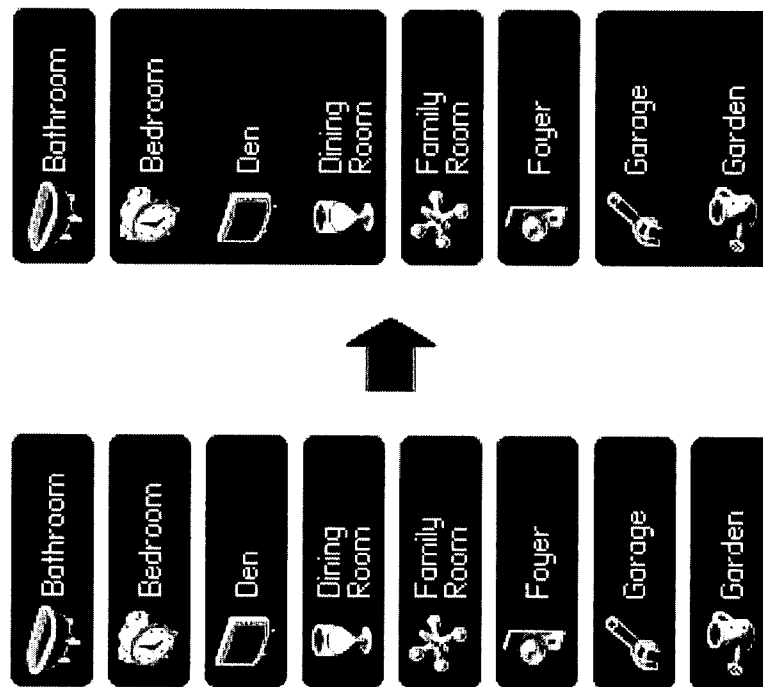


FIG. 3B

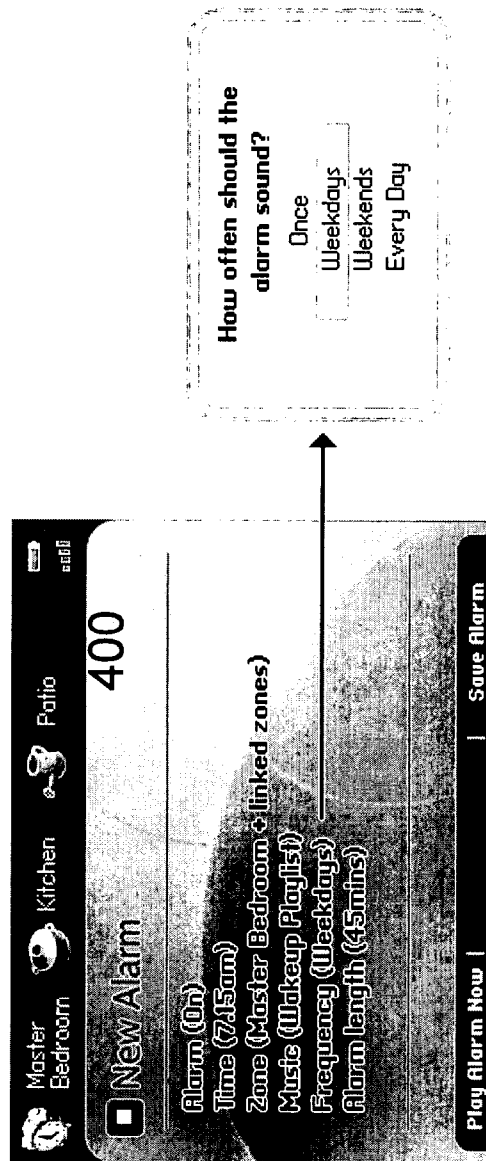


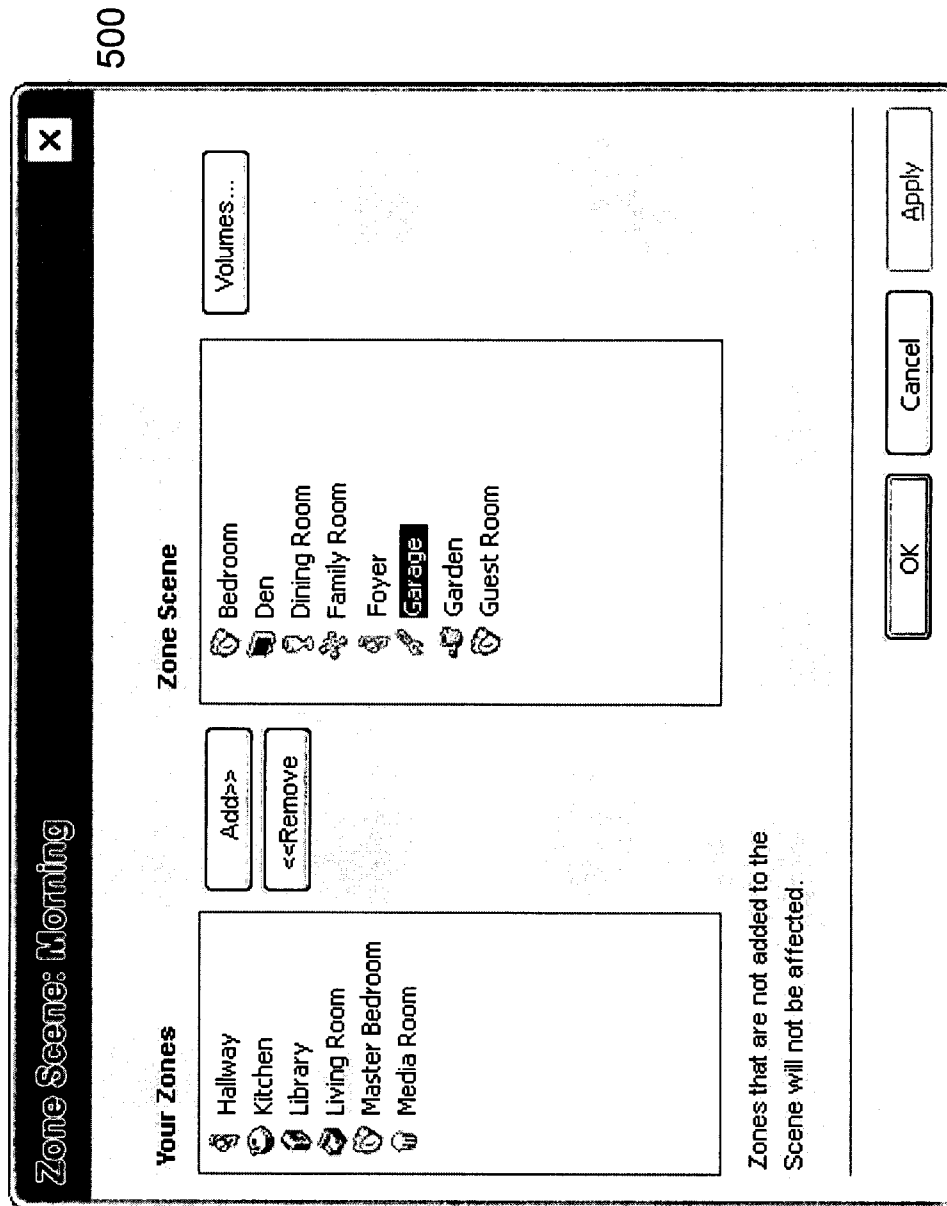
FIG. 4

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**FIG. 5A**

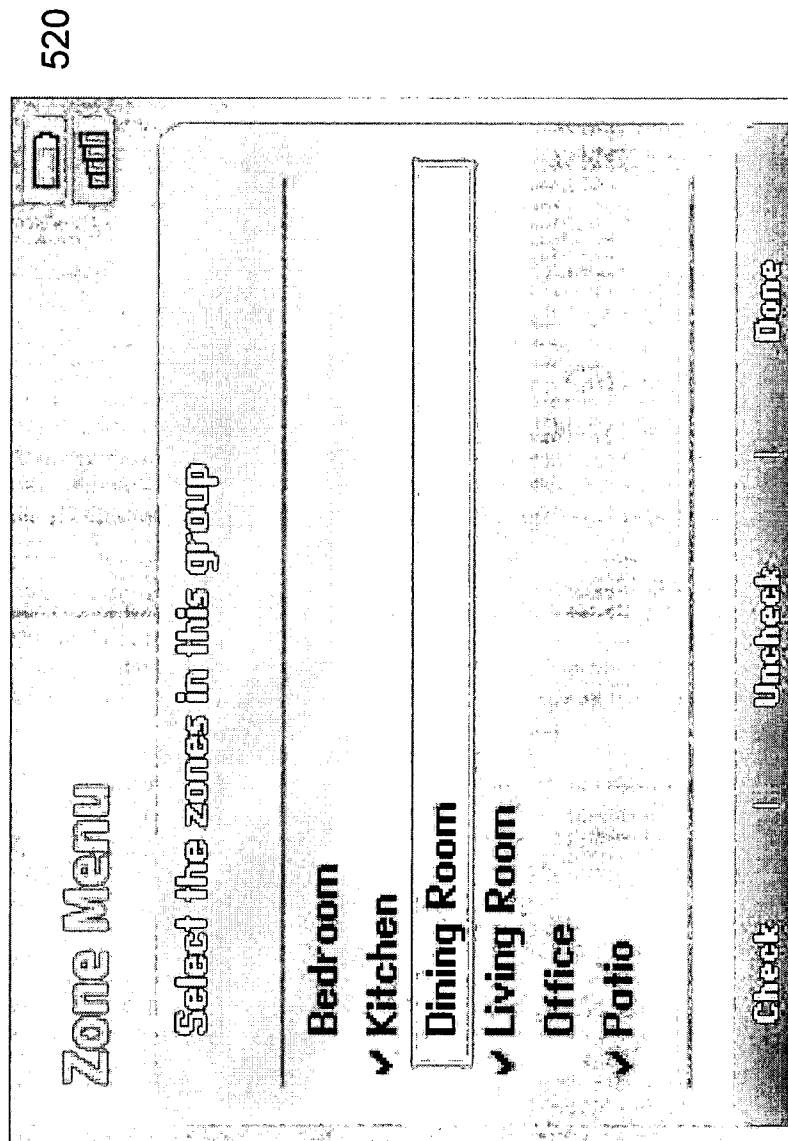
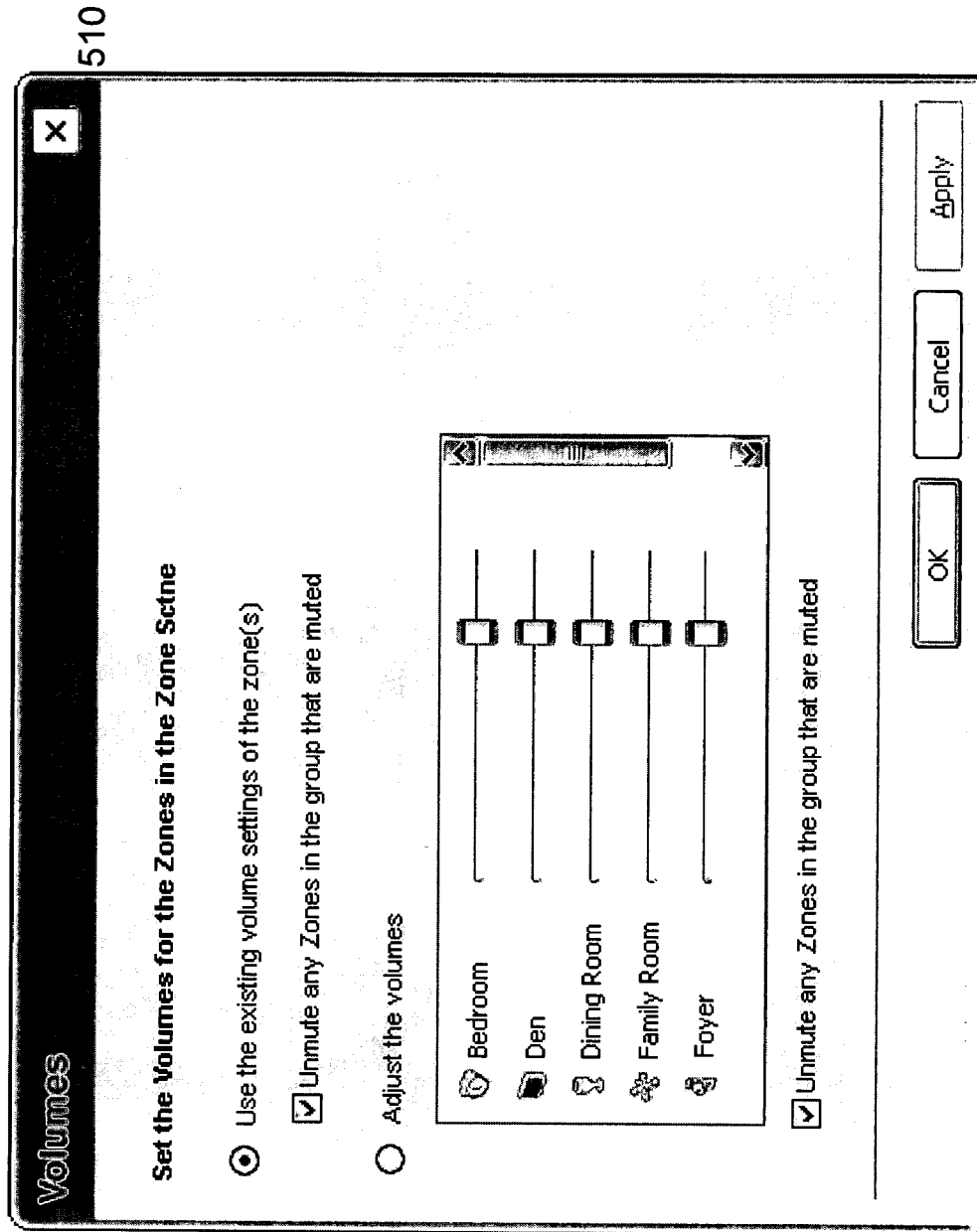
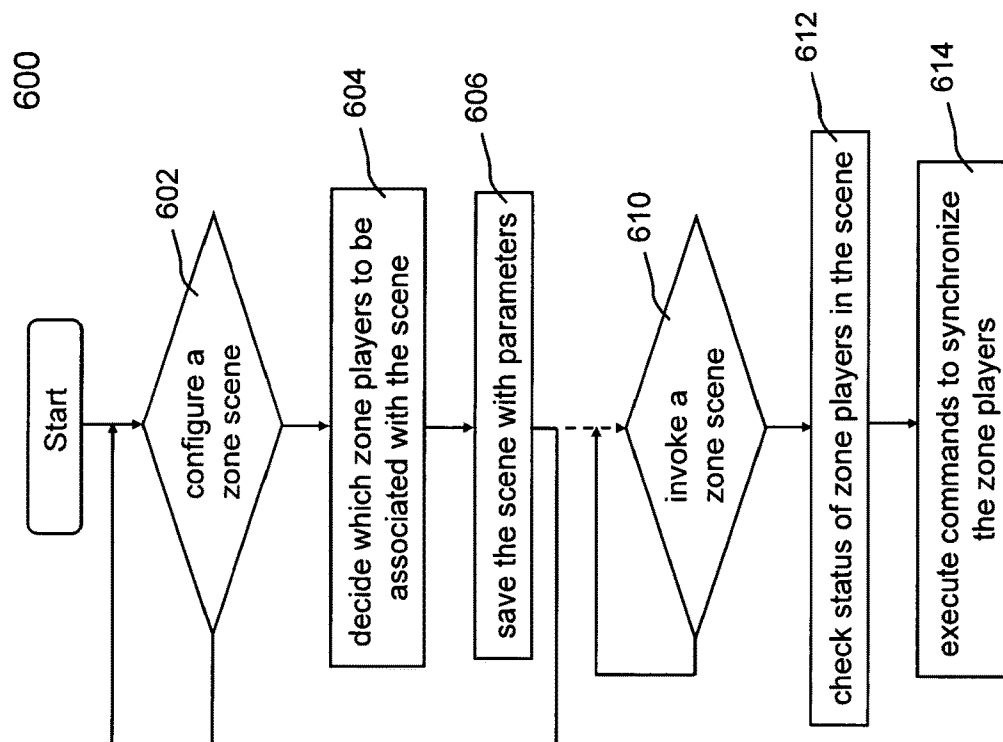


FIG. 5B

**FIG. 5C**

**FIG. 6**

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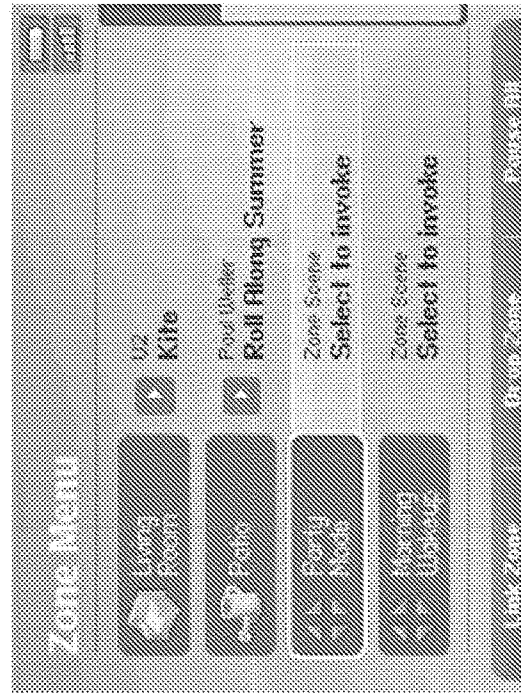


FIG. 7

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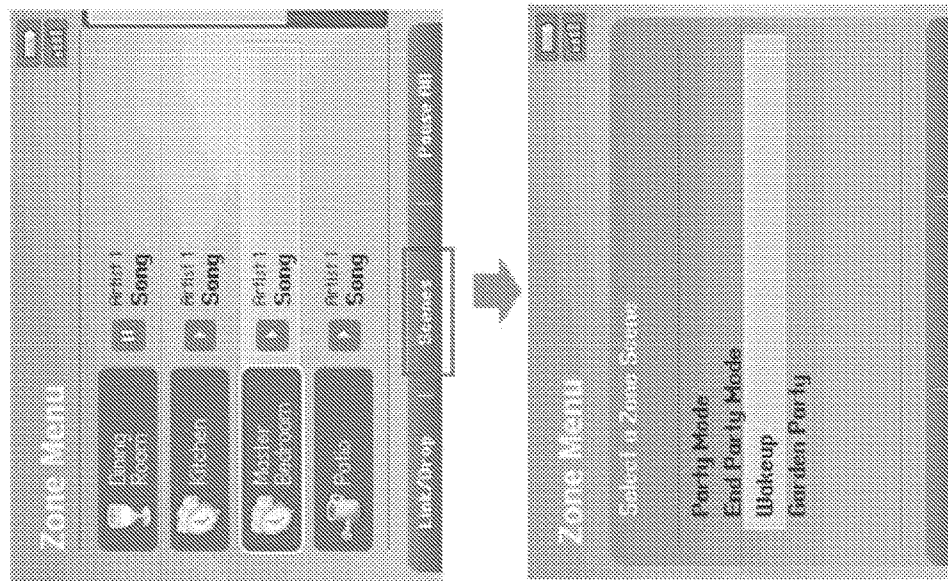


FIG. 8

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ZONE SCENE MANAGEMENT**CROSS REFERENCE TO RELATED APPLICATIONS**

This application is a continuation of and claims priority to U.S. patent application Ser. No. 15/130,919, filed on Apr. 15, 2016, entitled "ZONE SCENE ACTIVATION," which is a continuation of U.S. patent application Ser. No. 14/465,457, filed on Aug. 21, 2014, entitled "METHOD AND APPARATUS FOR UPDATING ZONE CONFIGURATIONS IN A MULTI-ZONE SYSTEM," which is a continuation of U.S. patent application Ser. No. 13/896,829, filed on May 17, 2013, entitled "METHOD AND APPARATUS FOR UPDATING ZONE CONFIGURATIONS IN A MULTI-ZONE SYSTEM," which is a continuation of U.S. patent application Ser. No. 11/853,790, filed Sep. 11, 2007, entitled "CONTROLLING AND MANIPULATING GROUPINGS IN A MULTI-ZONE MEDIA SYSTEM," which claims priority to U.S. Provisional Application No. 60/825,407 filed on Sep. 12, 2006, entitled "CONTROLLING AND MANIPULATING GROUPINGS IN A MULTI-ZONE MEDIA SYSTEM," each of which is hereby incorporated by reference in its entirety for all purposes.

BACKGROUND OF THE INVENTION**Field of the Invention**

The invention is generally related to the area of consumer electronics and human-computer interaction. In particular, the invention is related to method and apparatus for controlling or manipulating a plurality of multimedia players in a multi-zone system.

An enduring passion for quality audio reproduction or system is continuing to drive demands from users. One of the demands includes an audio system in a house in which, for example, one could grill to classic rock on a patio while another one may cook up his/her own music selections in a kitchen. This is all at the same time while a teenager catches a ballgame in a family room, and another one blasts pop in a bedroom. And the best part of such audio system is that each family member does not need his or her own stereo system—one system gives everyone access to all the music sources.

Currently, one of the systems that can meet part of such demand is a conventional multi-zone audio system that usually includes a number of audio players. Each of the audio players has its own amplifier(s) and a set of speakers and typically installed in one place (e.g., a room). In order to play an audio source at one location, the audio source must be provided locally or from a centralized location. When the audio source is provided locally, the multi-zone audio system functions as a collection of many stereo systems, making source sharing difficult. When the audio source is provided centrally, the centralized location may include a juke box, many compact discs, an AM or FM radio, tapes, or others. To send an audio source to an audio player demanding such source, a cross-bar type of device is used to prevent the audio source from going to other audio players that may be playing other audio sources.

In order to achieve playing different audio sources in different audio players, the traditional multi-zone audio system is generally either hard-wired or controlled by a pre-configured and pre-programmed controller. While the pre-programmed configuration may be satisfactory in one situation, it may not be suitable for another situation. For

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example, a person would like to listen to broadcast news from his/her favorite radio station in a bedroom, a bathroom and a den while preparing to go to work in the morning. The same person may wish to listen in the den and the living room to music from a compact disc in the evening. In order to satisfy such requirements, two groups of audio players must be established. In the morning, the audio players in the bedroom, the bathroom and the den need to be grouped for the broadcast news. In the evening, the audio players in the den and the living room are grouped for the music. Over the weekend, the audio players in the den, the living room, and a kitchen are grouped for party music. Because the morning group, the evening group and the weekend group contain the den, it can be difficult for the traditional system to accommodate the requirement of dynamically managing the ad hoc creation and deletion of groups.

There is a need for dynamic control of the audio players as a group. With a minimum manipulation, the audio players may be readily grouped. In a traditional multi-zone audio system, the audio players have to be adjusted one at a time, resulting in an inconvenient and non-homogenous audio environment. Further, there is a need to individually or systematically adjust the audio volume of the audio players.

SUMMARY OF THE INVENTION

This section is for the purpose of summarizing some aspects of the present invention and to briefly introduce some preferred embodiments. Simplifications or omissions in this section as well as in the abstract or the title of this description may be made to avoid obscuring the purpose of this section, the abstract and the title. Such simplifications or omissions are not intended to limit the scope of the present invention.

In general, the present invention pertains to controlling a plurality of multimedia players, or simply players, in groups. According to one aspect of the present invention, a mechanism is provided to allow a user to group some of the players according to a theme or scene, where each of the players is located in a zone. When the scene is activated, the players in the scene react in a synchronized manner. For example, the players in the scene are all caused to play an audio source or music in a playlist, wherein the audio source may be located anywhere on a network.

According to another aspect of the present invention, the scene may be activated at any time or a specific time. A user may activate the scene at any time so that only some selected zones in an entertainment system facilitate a playback of an audio source. When the scene is activated at a specific time, the scene may be used as an alarm or buzzer.

According to still another aspect of the present invention, a controlling device (also referred to herein as controller) is provided to facilitate a user to select any of the players in the system to form respective groups each of which is set up per a scene. Although various scenes may be saved in any of the members in a group, commands are preferably sent from the controller to the rest of the members when one of the scenes is executed. Depending on implementation, the commands include parameters pertaining to identifiers of the players, volumes settings, audio source and etc.

According to yet another aspect of the present invention, a configurable module is implemented in the controlling device that provides interactive graphic user interface for forming, managing and controlling groups in the system, de-grouping a group or adjusting audio volume of individual players or a group of players.

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The present invention may be implemented in many forms including software, hardware or a combination of both. According to one embodiment, the present invention is directed to a method for groupings in a multi-zone media system, the method comprises providing a mechanism to allow a user to determine which players in the system to be associated with a theme representing a group; and configuring the theme with parameters pertaining to the players, wherein the theme is activated at anytime or a specific time so that the players react in a synchronized manner. The players in a scene are synchronized to play a multimedia file when the scene is activated.

According to another embodiment, the present invention is directed to an entertainment system for grouping players, the system comprises: a plurality of players, each located in one zone; and a controller providing a mechanism to allow a user to select which of the players to be associated with a theme representing a group; and configure the theme with parameters pertaining to the selected players, wherein the theme is activated at anytime or a specific time so that the selected players react in a synchronized manner. As a result, the selected players are synchronized to play a multimedia that is in a digital format and retrieved from a source over a network.

One of the objects, features, and advantages of the present invention is to remotely control a plurality of multimedia players in a multi-zone system, playing and controlling the audio source synchronously if the players are grouped together, or playing and controlling the audio source individually if the players are disassociated with each other.

Other objects, features, and advantages of the present invention will become apparent upon examining the following detailed description of an embodiment thereof, taken in conjunction with the attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features, aspects, and advantages of the present invention will become better understood with regard to the following description, appended claims, and accompanying drawings where:

FIG. 1 shows an exemplary configuration in which the present invention may be practiced;

FIG. 2A shows an exemplary functional block diagram of a player in accordance with the present invention;

FIG. 2B shows an example of a controller that may be used to remotely control one of more players of FIG. 2A;

FIG. 2C shows an exemplary internal functional block diagram of a controller in accordance with one embodiment of the present invention;

FIG. 3A provides an illustration of one zone scene, where the left column shows the starting zone grouping—all zones are separate, the column on the right shows the effects of grouping the zones to make a group of 3 zones named after “Morning”;

FIG. 3B shows that a user defines multiple groups to be gathered at the same time;

FIG. 4 shows an exemplary user interface that may be displayed on a controller or a computer of FIG. 1;

FIG. 5A shows a user interface to allow a user to form a scene;

FIG. 5B shows another user interface 520 to allow a user to form a scene;

FIG. 5C shows a user interface to allow a user to adjust a volume level of the zone players in a zone scene individually or collectively;

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FIG. 6 shows a flowchart or process of providing a player theme or a zone scene for a plurality of players, where one or more of the players are placed in a zone; and

FIG. 7 shows an example user interface for invoking a zone scene; and

FIG. 8 shows another example user interface for invoking a zone scene.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The detailed description of the invention is presented largely in terms of procedures in terms of procedures, steps, logic blocks, processing, and other symbolic representations that directly or indirectly resemble the operations of data processing devices coupled to networks. These process descriptions and representations are typically used by those skilled in the art to most effectively convey the substance of their work to others skilled in the art. Numerous specific details are set forth in order to provide a thorough understanding of the present invention. However, it will become obvious to those skilled in the art that the present invention may be practiced without these specific details. In other instances, well known methods, procedures, components, and circuitry have not been described in detail to avoid unnecessarily obscuring aspects of the present invention.

Reference herein to “one embodiment” or “an embodiment” means that a particular feature, structure, or characteristic described in connection with the embodiment can be included in at least one embodiment of the invention. The appearances of the phrase “in one embodiment” in various places in the specification are not necessarily all referring to the same embodiment, nor are separate or alternative embodiments mutually exclusive of other embodiments. Further, the order of blocks in process flowcharts or diagrams representing one or more embodiments of the invention do not inherently indicate any particular order nor imply any limitations in the invention.

Referring now to the drawings, in which like numerals refer to like parts throughout the several views. FIG. 1 shows an exemplary configuration 100 in which the present invention may be practiced. The configuration may represent, but not be limited to, a part of a residential home, a business building or a complex with multiple zones. There are a number of multimedia players of which three examples 102, 104 and 106 are shown as audio devices. Each of the audio devices may be installed or provided in one particular area or zone and hence referred to as a zone player herein.

As used herein, unless explicitly stated otherwise, an audio source or audio sources are in digital format and can be transported or streamed over a data network. To facilitate the understanding of the present invention, it is assumed that the configuration 100 represents a home. Thus, the zone player 102 and 104 may be located in two of the bedrooms respectively while the zone player 106 may be installed in a living room. All of the zone players 102, 104 and 106 are coupled directly or indirectly to a data network 108. In addition, a computing device 110 is shown to be coupled on the network 108. In reality, any other devices such as a home gateway device, a storage device, or an MP3 player may be coupled to the network 108 as well.

The network 108 may be a wired network, a wireless network or a combination of both. In one example, all devices including the zone players 102, 104 and 106 are coupled to the network 108 by wireless means based on an industry standard such as IEEE 802.11. In yet another example, all devices including the zone players 102, 104 and

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106 are part of a local area network that communicates with a wide area network (e.g., the Internet).

Many devices on the network **108** are configured to download and store audio sources. For example, the computing device **110** can download audio sources from the Internet and store the downloaded sources locally for sharing with other devices on the Internet or the network **108**. The computing device **110** or any of the zone players can also be configured to receive streaming audio. Shown as a stereo system, the device **112** is configured to receive an analog audio source (e.g., from broadcasting) or retrieve a digital audio source (e.g., from a compact disk). The analog audio sources can be converted to digital audio sources. In accordance with the present invention, the audio source may be shared among the devices on the network **108**.

Two or more zone players may be grouped together to form a new zone group. Any combinations of zone players and an existing zone group may be grouped together. In one instance, a new zone group is formed by adding one zone player to another zone player or an existing zone group.

Referring now to FIG. 2A, there is shown an exemplary functional block diagram of a zone player **200** in accordance with the present invention. The zone player **200** includes a network interface **202**, a processor **204**, a memory **206**, an audio processing circuit **210**, a module **212**, and optionally, an audio amplifier **214** that may be internal or external. The network interface **202** facilitates a data flow between a data network (i.e., the data network **108** of FIG. 1) and the zone player **200** and typically executes a special set of rules (i.e., a protocol) to send data back and forth. One of the common protocols used in the Internet is TCP/IP (Transmission Control Protocol/Internet Protocol). In general, a network interface manages the assembling of an audio source or file into smaller packets that are transmitted over the data network or reassembles received packets into the original source or file. In addition, the network interface **202** handles the address part of each packet so that it gets to the right destination or intercepts packets destined for the zone player **200**.

The network interface **202** may include one or both of a wireless interface **216** and a wired interface **217**. The wireless interface **216**, also referred to as a RF interface, provides network interface functions by a wireless means for the zone player **200** to communicate with other devices in accordance with a communication protocol (such as the wireless standard IEEE 802.11a, 802.11b or 802.11g). The wired interface **217** provides network interface functions by a wired means (e.g., an Ethernet cable). In one embodiment, a zone player includes both of the interfaces **216** and **217**, and other zone players include only a RF or wired interface. Thus these other zone players communicate with other devices on a network or retrieve audio sources via the zone player. The processor **204** is configured to control the operation of other parts in the zone player **200**. The memory **206** may be loaded with one or more software modules that can be executed by the processor **204** to achieve desired tasks. According to one aspect of the present invention, a software module implementing one embodiment of the present invention is executed, the processor **204** operates in accordance with the software module in reference to a saved zone group configuration characterizing a zone group created by a user, the zone player **200** is caused to retrieve an audio source from another zone player or a device on the network.

According to one embodiment of the present invention, the memory **206** is used to save one or more saved zone configuration files that may be retrieved for modification at

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any time. Typically, a saved zone group configuration file is transmitted to a controller (e.g., the controlling device **140** or **142** of FIG. 1, a computer, a portable device, or a TV) when a user operates the controlling device. The zone group configuration provides an interactive user interface so that various manipulations or control of the zone players may be performed.

The audio processing circuit **210** resembles most of the circuitry in an audio playback device and includes one or more digital-to-analog converters (DAC), an audio preprocessing part, an audio enhancement part or a digital signal processor and others. In operation, when an audio source is retrieved via the network interface **202**, the audio source is processed in the audio processing circuit **210** to produce analog audio signals. The processed analog audio signals are then provided to the audio amplifier **214** for playback on speakers. In addition, the audio processing circuit **210** may include necessary circuitry to process analog signals as inputs to produce digital signals for sharing with other devices on a network.

Depending on an exact implementation, the module **212** may be implemented as a combination of hardware and software. In one embodiment, the module **212** is used to save a scene. The audio amplifier **214** is typically an analog circuit that powers the provided analog audio signals to drive one or more speakers.

Referring now to FIG. 2B, there is shown an exemplary controller **240**, which may correspond to the controlling device **140** or **142** of FIG. 1. The controller **240** may be used to facilitate the control of multi-media applications, automation and others in a complex. In particular, the controller **240** is configured to facilitate a selection of a plurality of audio sources available on the network, controlling operations of one or more zone players (e.g., the zone player **200**) through a RF interface corresponding to the RF interface **216** of FIG. 2A. According to one embodiment, the wireless means is based on an industry standard (e.g., infrared, radio, wireless standard IEEE 802.11a, 802.11b or 802.11g). When a particular audio source is being played in the zone player **200**, a picture, if there is any, associated with the audio source may be transmitted from the zone player **200** to the controller **240** for display. In one embodiment, the controller **240** is used to synchronize more than one zone players by grouping the zone players in a group. In another embodiment, the controller **240** is used to control the volume of each of the zone players in a zone group individually or together.

The user interface for the controller **240** includes a screen **242** (e.g., a LCD screen) and a set of functional buttons as follows: a "zones" button **244**, a "back" button **246**, a "music" button **248**, a scroll wheel **250**, "ok" button **252**, a set of transport control buttons **254**, a mute button **262**, a volume up/down button **264**, a set of soft buttons **266** corresponding to the labels **268** displayed on the screen **242**.

The screen **242** displays various screen menus in response to a user's selection. In one embodiment, the "zones" button **244** activates a zone management screen or "Zone Menu", which is described in more details below. The "back" button **246** may lead to different actions depending on the current screen. In one embodiment, the "back" button triggers the current screen display to go back to a previous one. In another embodiment, the "back" button negates the user's erroneous selection. The "music" button **248** activates a music menu, which allows the selection of an audio source (e.g., a song) to be added to a zone player's music queue for playback.

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The scroll wheel **250** is used for selecting an item within a list, whenever a list is presented on the screen **242**. When the items in the list are too many to be accommodated in one screen display, a scroll indicator such as a scroll bar or a scroll arrow is displayed beside the list. When the scroll indicator is displayed, a user may rotate the scroll wheel **250** to either choose a displayed item or display a hidden item in the list. The “ok” button **252** is used to confirm the user selection on the screen **242**.

There are three transport buttons **254**, which are used to control the effect of the currently playing song. For example, the functions of the transport buttons may include play/pause and forward/rewind a song, move forward to a next song track, or move backward to a previous track. According to one embodiment, pressing one of the volume control buttons such as the mute button **262** or the volume up/down button **264** activates a volume panel. In addition, there are three soft buttons **266** that can be activated in accordance with the labels **268** on the screen **242**. It can be understood that, in a multi-zone system, there may be multiple audio sources being played respectively in more than one zone players. The music transport functions described herein shall apply selectively to one of the sources when a corresponding one of the zone players or zone groups is selected.

FIG. 2C illustrates an internal functional block diagram of an exemplary controller **270**, which may correspond to the controller **240** of FIG. 2B. The screen **272** on the controller **270** may be a LCD screen. The screen **272** communicates with and is commanded by a screen driver **274** that is controlled by a microcontroller (e.g., a processor) **276**. The memory **282** may be loaded with one or more application modules **284** that can be executed by the microcontroller **276** with or without a user input via the user interface **278** to achieve desired tasks. In one embodiment, an application module is configured to facilitate grouping a number of selected zone players into a zone group and synchronizing the zone players for one audio source. In another embodiment, an application module is configured to control together the audio volumes of the zone players in a zone group. In operation, when the microcontroller **276** executes one of the application modules **284**, the screen driver **274** generates control signals to drive the screen **272** to display an application specific user interface accordingly, more of which will be described below.

The controller **270** includes a network interface **280** referred to as a RF interface **280** that facilitates wireless communication with a zone player via a corresponding RF interface thereof. In one embodiment, the commands such as volume control and audio playback synchronization are sent via the RF interfaces. In another embodiment, a saved zone group configuration is transmitted between a zone player and a controller via the RF interfaces. The controller **270** may control one or more zone players, such as **102**, **104** and **106** of FIG. 1. Nevertheless, there may be more than one controllers, each preferably in a zone (e.g., a room) and configured to control any one and all of the zone players.

In one embodiment, a user creates a zone group including at least two zone players from the controller **240** that sends signals or data to one of the zone players. As all the zone players are coupled on a network, the received signals in one zone player can cause other zone players in the group to be synchronized so that all the zone players in the group playback an identical audio source or a list of identical audio sources in a timely synchronized manner. Similarly, when a user increases the audio volume of the group from the controller, the signals or data of increasing the audio volume

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for the group are sent to one of the zone players and causes other zone players in the group to be increased together in volume and in scale.

According to one implementation, an application module is loaded in memory **282** for zone group management. When a predetermined key (e.g. the “zones” button **244**) is activated on the controller **240**, the application module is executed in the microcontroller **276**. The input interface **278** coupled to and controlled by the microcontroller **276** receives inputs from a user. A “Zone Menu” is then displayed on the screen **272**. The user may start grouping zone players into a zone group by activating a “Link Zones” or “Add Zone” soft button, or de-grouping a zone group by activating an “Unlink Zones” or “Drop Zone” button. The detail of the zone group manipulation will be further discussed below.

As described above, the input interface **278** includes a number of function buttons as well as a screen graphical user interface. It should be pointed out that the controller **240** in FIG. 2B is not the only controlling device that may practice the present invention. Other devices that provide the equivalent control functions (e.g., a computing device, a hand-held device) may also be configured to practice the present invention. In the above description, unless otherwise specifically described, it is clear that keys or buttons are generally referred to as either the physical buttons or soft buttons, enabling a user to enter a command or data.

One mechanism for ‘joining’ zone players together for music playback is to link a number of zone players together to form a group. To link a number of zone players together, a user may manually link each zone player or room one after the other. For example, there is a multi-zone system that includes the following zones.

- Bathroom
- Bedroom
- Den
- Dining Room
- Family Room
- Foyer

If the user wishes to link **5** of the **6** zone players using the current mechanism, he/she must start with a single zone and then manually link each zone to that zone. This mechanism may be sometimes quite time consuming. According to one embodiment, a set of zones can be dynamically linked together using one command. Using what is referred to herein as a theme or a zone scene, zones can be configured in a particular scene (e.g., morning, afternoon, or garden), where a predefined zone grouping and setting of attributes for the grouping are automatically effectuated.

For instance, a “Morning” zone scene/configuration command would link the Bedroom, Den and Dining Room together in one action. Without this single command, the user would need to manually and individually link each zone. FIG. 3A provides an illustration of one zone scene, where the left column shows the starting zone grouping—all zones are separate, the column on the right shows the effects of grouping the zones to make a group of 3 zones named after “Morning”.

Expanding this idea further, a Zone Scene can be set to create multiple sets of linked zones. For example, a scene creates **3** separate groups of zones, the downstairs zones would be linked together, the upstairs zones would be linked together in their own group, and the outside zones (in this case the patio) would move into a group of its own.

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In one embodiment as shown in FIG. 3B, a user defines multiple groups to be gathered at the same time. For example: an “Evening Scene” is desired to link the following zones:

Group 1
Bedroom
Den
Dining Room
Group 2
Garage
Garden

where Bathroom, Family Room and Foyer should be separated from any group if they were part of a group before the Zone Scene was invoked.

One important of the features, benefits and objects in the present invention is that zones do not need to be separated before a zone scene is invoked. In one embodiment, a command is provided and links all zones in one step, if invoked. The command is in a form of a zone scene. After linking the appropriate zones, a zone scene command could apply the following attributes:

Set volumes levels in each zones (each zone can have a different volume)

Mute/Unmute zones.

Select and play specific music in the zones.

Set the play mode of the music (Shuffle, Repeat, Shuffle-repeat)

Set the music playback equalization of each zone (e.g., bass treble).

A further extension of this embodiment is to trigger a zone scene command as an alarm clock function. For instance the zone scene is set to apply at 8:00 am. It could link appropriate zones automatically, set specific music to play and then stop the music after a defined duration. Although a single zone may be assigned to an alarm, a scene set as an alarm clock provides a synchronized alarm, allowing any zones linked in the scene to play a predefined audio (e.g., a favorable song, a predefined playlist) at a specific time or for a specific duration. If, for any reason, the scheduled music failed to be played (e.g., an empty playlist, no connection to a share, failed UPnP, no Internet connection for an Internet Radio station), a backup buzzer will sound. This buzzer will be a sound file that is stored in a zone player.

FIG. 4 shows an exemplary user interface 400 that may be displayed on a controller 142 or a computer 110 of FIG. 1. The interface 400 shows a list of items that may be set up by a user to cause a scene to function at a specific time. In the embodiment shown in FIG. 4, the list of items includes “Alarm”, “Time”, “Zone”, “Music”, “Frequency” and “Alarm length”. “Alarm” can be set on or off. When “Alarm” is set on, “Time” is a specific time to set off the alarm. “Zone” shows which zone players are being set to play a specified audio at the specific time. “Music” shows what to be played when the specific time arrives. “Frequency” allows the user to define a frequency of the alarm. “Alarm length” defines how long the audio is to be played. It should be noted that the user interface 400 is provided herein to show some of the functions associated with setting up an alarm. Depending on an exact implementation, other functions, such as time zone, daylight savings, time synchronization, and time/date format for display may also be provided without departing from the present invention.

According to one embodiment, each zone player in a scene may be set up for different alarms. For example, a “Morning” scene includes three zone players, each in a bedroom, a den, and a dining room. After selecting the

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scene, the user may set up an alarm for the scene as whole. As a result, each of the zone players will be activated at a specific time.

FIG. 5A shows a user interface 500 to allow a user to form a scene. The panel on the left shows the available zones in a household. The panel on the right shows the zones that have been selected and be grouped as part of this scene. Depending on an exact implementation of a user interface, Add/Remove buttons may be provided to move zones between the panels, or zones may be dragged along between panels.

FIG. 5B shows another user interface 520 to allow a user to form a scene. The user interface 520 that may be displayed on a controller or a computing device, lists available zones in a system. The list of zones in the user interface 520 includes ALL the zones in the system, including the zones that are already grouped. A checkbox is provide next to each of the zones so that a user may check in the zones to be associated with the scene.

FIG. 5C shows a user interface 510 to allow a user to adjust a volume level of the zone players in a zone scene individually or collectively. As shown in the user interface 510, the ‘Volumes . . .’ button (shown as sliders, other forms are possible) allows the user to affect the volumes of the associated zone players when a zone scene is invoked. In one embodiment, the zone players can be set to retain whatever volume that they currently have when the scene is invoked. Additionally the user can decide if the volumes should be unmuted or muted when the scene is invoked.

FIG. 6 shows a flowchart or process 600 of providing a player theme or a zone scene for a plurality of players, where one or more of the players are placed in a zone. The process 600 is presented in accordance with one embodiment of the present invention and may be implemented in a module to be located in the memory 282 of FIG. 2C.

The process 600 is initiated only when a user decides to proceed with a zone scene at 602. The process 600 then moves to 604 where it allows a user to decide which zone players to be associated with the scene. For example, there are ten players in a household, and the scene is named after “Morning”. The user may be given an interface to select four of the ten players to be associated with the scene. At 606, the scene is saved. The scene may be saved in any one of the members in the scene. In the example of FIG. 1, the scene is saved in one of the zone players and displayed on the controller 142. In operation, a set of data pertaining to the scene includes a plurality of parameters. In one embodiment, the parameters include, but may not be limited to, identifiers (e.g., IP address) of the associated players and a playlist. The parameters may also include volume/tone settings for the associated players in the scene. The user may go back to 602 to configure another scene if desired.

Given a saved scene, a user may activate the scene at any time or set up a timer to activate the scene at 610. The process 600 can continue when a saved scene is activated at 610. At 612, upon the activation of a saved scene, the process 600 checks the status of the players associated with the scene. The status of the players means that each of the players shall be in condition to react in a synchronized manner. In one embodiment, the interconnections of the players are checked to make sure that the players communicate among themselves and/or with a controller if there is such a controller in the scene.

It is assumed that all players associated with the scene are in good condition. At 614, commands are executed with the parameters (e.g., pertaining to a playlist and volumes). In one embodiment, data including the parameters is trans-

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ported from a member (e.g., a controller) to other members in the scene so that the players are caused to synchronize an operation configured in the scene. The operation may cause all players to play back a song in identical or different volumes or to play back a pre-stored file.

One of the features, benefits and advantages in the present invention is to allow sets of related devices (controllers and operating components) to exist as a group without interfering with other components that are potentially visible on the same wired or wireless network. Each of the sets is configured to a theme or a scene.

FIG. 7 shows an example user interface for invoking a zone scene. The user interface of FIG. 7 shows a Zone Menu that includes selectable indications of zone scenes.

FIG. 8 shows another example user interface for invoking a zone scene. FIG. 8 shows a Zone Menu that includes a softkey indicating a Scenes menu. Pressing the Scenes softkey will show the Scenes menu where all the available zone scenes are shown as selectable indications.

The present invention has been described in sufficient detail with a certain degree of particularity. It is understood to those skilled in the art that the present disclosure of embodiments has been made by way of examples only and that numerous changes in the arrangement and combination of parts may be resorted without departing from the spirit and scope of the invention as claimed. While the embodiments discussed herein may appear to include some limitations as to the presentation of the information units, in terms of the format and arrangement, the invention has applicability well beyond such embodiment, which can be appreciated by those skilled in the art. Accordingly, the scope of the present invention is defined by the appended claims rather than the foregoing description of embodiments.

I claim:

1. A computing device comprising: one or more processors;

a non-transitory computer-readable medium; and program instructions stored on the non-transitory computer-readable medium that, when executed by the one or more processors, cause the computing device to perform functions comprising:

while serving as a controller for a networked media playback system comprising a first zone player and at least two other zone players, wherein the first zone player is operating in a standalone mode in which the first zone player is configured to play back media individually:

receiving a first request to create a first zone scene comprising a first predefined grouping of zone players including at least the first zone player and a second zone player that are to be configured for synchronous playback of media when the first zone scene is invoked;

based on the first request, i) causing creation of the first zone scene, ii) causing an indication of the first zone scene to be transmitted to the first zone player, and iii) causing storage of the first zone scene;

receiving a second request to create a second zone scene comprising a second predefined grouping of zone players including at least the first zone player and a third zone player that are to be configured for synchronous playback of media when the second zone scene is invoked, wherein the third zone player is different than the second zone player;

based on the second request, i) causing creation of the second zone scene, ii) causing an indication of the second zone scene to be transmitted to the first zone player, and iii) causing storage of the second zone

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scene; displaying a representation of the first zone scene and a representation of the second zone scene; and while displaying the representation of the first zone scene and the representation of the second zone scene, receiving a third request to invoke the first zone scene; and

based on the third request, causing the first zone player to transition from operating in the standalone mode to operating in accordance with the first predefined grouping of zone players such that the first zone player is configured to coordinate with at least the second zone player to output media in synchrony with output of media by at least the second zone player.

2. The computing device of claim 1, further comprising program instructions stored on the non-transitory computer-readable medium that, when executed by the one or more processors, cause the computing device to perform functions comprising:

while the first zone player is configured to coordinate with at least the second zone player to play back media in synchrony with at least the second zone player, receiving a fourth request to invoke the second zone scene; and

based on the fourth request, causing the first zone player to (a) cease to operate in accordance with the first predefined grouping of zone players such that the first zone player is no longer configured to coordinate with at least the second zone player to output media in synchrony with output of media by at least the second zone player and (b) begin to operate in accordance with the second predefined grouping of zone players such that the first zone player is configured to coordinate with at least the third zone player to output media in synchrony with output of media by at least the third zone player.

3. The computing device of claim 1, wherein causing storage of the first zone scene comprises causing storage of the first zone scene at a location other than the computing device, and wherein causing storage of the second zone scene comprises causing storage of the second zone scene at the location other than the computing device.

4. The computing device of claim 3, wherein the location other than the computing device comprises a zone player of the first predefined grouping of zone players.

5. The computing device of claim 1, wherein the first zone scene further comprises an indication of predetermined media to be played when the first zone scene is invoked, and wherein the computing device further comprises program instructions stored on the non-transitory computer-readable medium that, when executed by the one or more processors, cause the computing device to perform functions comprising:

based on the third request, causing the first zone player to coordinate with at least the second zone player to output the predetermined media in synchrony with output of the predetermined media by at least the second zone player.

6. The computing device of claim 1, wherein the first predefined grouping of zone players does not include the third zone player, and wherein the second predefined grouping of zone players does not include the second zone player.

7. The computing device of claim 1, further comprising program instructions stored on the non-transitory computer-readable medium that, when executed by the one or more processors, cause the computing device to perform functions comprising:

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before displaying the representation of the first zone scene and the representation of the second zone scene, receiving, from another device over a data network, data defining the first zone scene and data defining the second zone scene.

8. The computing device of claim 1, wherein receiving the first request comprises receiving a first set of one or more inputs via a user interface of the computing device, wherein receiving the second request comprises receiving a second set of one or more inputs via the user interface, and wherein receiving the third request comprises receiving a third set of one or more inputs via the user interface.

9. A non-transitory computer-readable medium, wherein the non-transitory computer-readable medium is provisioned with program instructions that are executable to cause a computing device to perform functions comprising:

while serving as a controller for a networked media playback system comprising a first zone player and at least two other zone players, wherein the first zone player is operating in a standalone mode in which the first zone player is configured to play back media individually;

receiving a first request to create a first zone scene comprising a first predefined grouping of zone players including at least the first zone player and a second zone player that are to be configured for synchronous playback of media when the first zone scene is invoked; based on the first request, i) causing creation of the first zone scene, ii) causing an indication of the first zone scene to be transmitted to the first zone player, and iii) causing storage of the first zone scene;

receiving a second request to create a second zone scene comprising a second predefined grouping of zone players including at least the first zone player and a third zone player that are to be configured for synchronous playback of media when the second zone scene is invoked, wherein the third zone player is different than the second zone player;

based on the second request, i) causing creation of the second zone scene, ii) causing an indication of the second zone scene to be transmitted to the first zone player, and iii) causing storage of the second zone scene;

displaying a representation of the first zone scene and a representation of the second zone scene; and

while displaying the representation of the first zone scene and the representation of the second zone scene, receiving a third request to invoke the first zone scene; and based on the third request, causing the first zone player to transition from operating in the standalone mode to operating in accordance with the first predefined grouping of zone players such that the first zone player is configured to coordinate with at least the second zone player to output media in synchrony with output of media by at least the second zone player.

10. The non-transitory computer-readable medium of claim 9, wherein the non-transitory computer-readable medium is also provisioned with program instructions stored on the non-transitory computer-readable medium that, when executed by the one or more processors, cause the computing device to perform functions comprising:

while the first zone player is configured to coordinate with at least the second zone player to play back media in synchrony with at least the second zone player, receiving a fourth request to invoke the second zone scene; and

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based on the fourth request, causing the first zone player to (a) cease to operate in accordance with the first predefined grouping of zone players such that the first zone player is no longer configured to coordinate with at least the second zone player to output media in synchrony with output of media by at least the second zone player and (b) begin to operate in accordance with the second predefined grouping of zone players such that the first zone player is configured to coordinate with at least the third zone player to output media in synchrony with output of media by at least the third zone player.

11. The non-transitory computer-readable medium of claim 9, wherein causing storage of the first zone scene comprises causing storage of the first zone scene at a location other than the computing device, and wherein causing storage of the second zone scene comprises causing storage of the second zone scene at the location other than the computing device.

12. The non-transitory computer-readable medium of claim 11, wherein the location other than the computing device comprises a zone player of the first predefined grouping of zone players.

13. The non-transitory computer-readable medium of claim 9, wherein the first zone scene further comprises an indication of predetermined media to be played when the first zone scene is invoked, and wherein the non-transitory computer-readable medium is also provisioned with program instructions stored on the non-transitory computer-readable medium that, when executed by the one or more processors, cause the computing device to perform functions comprising:

based on the third request, causing the first zone player to coordinate with at least the second zone player to output the predetermined media in synchrony with output of the predetermined media by at least the second zone player.

14. The non-transitory computer-readable medium of claim 9, wherein the first predefined grouping of zone players does not include the third zone player, and wherein the second predefined grouping of zone players does not include the second zone player.

15. The non-transitory computer-readable medium of claim 9, wherein the non-transitory computer-readable medium further comprises program instructions stored on the non-transitory computer-readable medium that, when executed by the one or more processors, cause the computing device to perform functions comprising:

before displaying the representation of the first zone scene and the representation of the second zone scene, receiving, from another device over a data network, data defining the first zone scene and data defining the second zone scene.

16. The non-transitory computer-readable medium of claim 9, wherein receiving the first request comprises receiving a first set of one or more inputs via a user interface of the computing device, wherein receiving the second request comprises receiving a second set of one or more inputs via the user interface, and wherein receiving the third request comprises receiving a third set of one or more inputs via the user interface.

17. A method executed by a computing device, the method comprising:

while serving as a controller for a networked media playback system comprising a first zone player and at least two other zone players, wherein the first zone

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player is operating in a standalone mode in which the first zone player is configured to play back media individually;

receiving a first request to create a first zone scene comprising a first predefined grouping of zone players including at least the first zone player and a second zone player that are to be configured for synchronous playback of media when the first zone scene is invoked; based on the first request, i) causing creation of the first zone scene, ii) causing an indication of the first zone scene to be transmitted to the first zone player, and iii) causing storage of the first zone scene;

receiving a second request to create a second zone scene comprising a second predefined grouping of zone players including at least the first zone player and a third zone player that are to be configured for synchronous playback of media when the second zone scene is invoked, wherein the third zone player is different than the second zone player;

based on the second request, i) causing creation of the second zone scene, ii) causing an indication of the second zone scene to be transmitted to the first zone player, and iii) causing storage of the second zone scene;

displaying a representation of the first zone scene and a representation of the second zone scene; and

while displaying the representation of the first zone scene and the representation of the second zone scene, receiving a third request to invoke the first zone scene; and based on the third request, causing the first zone player to transition from operating in the standalone mode to operating in accordance with the first predefined group-

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ing of zone players such that the first zone player is configured to coordinate with at least the second zone player to output media in synchrony with output of media by at least the second zone player.

18. The method of claim **17**, further comprising: while the first zone player is configured to coordinate with at least the second zone player to play back media in synchrony with at least the second zone player, receiving a fourth request to invoke the second zone scene; and

based on the fourth request, causing the first zone player to (a) cease to operate in accordance with the first predefined grouping of zone players such that the first zone player is no longer configured to coordinate with at least the second zone player to output media in synchrony with output of media by at least the second zone player and (b) begin to operate in accordance with the second predefined grouping of zone players such that the first zone player is configured to coordinate with at least the third zone player to output media in synchrony with output of media by at least the third zone player.

19. The method of claim **17**, wherein causing storage of the first zone scene comprises causing storage of the first zone scene at a location other than the computing device, wherein causing storage of the second zone scene comprises causing storage of the second zone scene at the location other than the computing device.

20. The method of claim **19**, wherein the location other than the computing device comprises a zone player of the first predefined grouping of zone players.

* * * * *

EXHIBIT 5



US009219460B2

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Bush

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(45) **Date of Patent:** **Dec. 22, 2015**

(54) **AUDIO SETTINGS BASED ON ENVIRONMENT**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 143 days.

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Written Opinion of the International Searching Authority for PCT/US2015/021000, dated Jun. 5, 2015.*

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H03G 5/16 (2006.01)

H04R 3/00 (2006.01)

H04R 29/00 (2006.01)

Primary Examiner — Brenda Bernardi

(74) Attorney, Agent, or Firm — McDonnell Boehnen Hulbert & Berghoff LLP

(52) U.S. Cl.

CPC **H03G 5/165** (2013.01); **H04R 3/00** (2013.01); **H04R 29/00** (2013.01)

(57) ABSTRACT

(58) Field of Classification Search

None

See application file for complete search history.

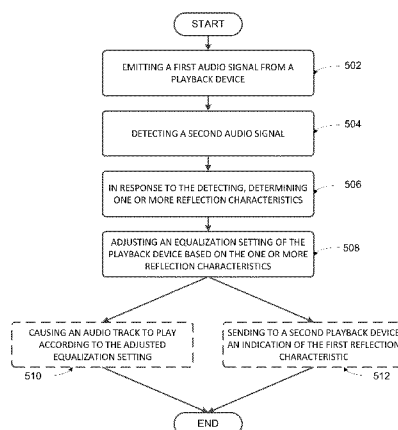
Embodiments described herein may involve dynamically adjusting the equalization of a playback device based on the environment in which the playback device is operating. One embodiment may involve emitting a first audio signal from a playback device, detecting, by the playback device, a second audio signal, where at least a portion of the second audio signal is a reflection of the first audio signal, in response to the detecting, determining one or more reflection characteristics, where each of the one or more reflection characteristics are based on at least the second audio signal, adjusting an equalization setting of the playback device based on the one or more reflection characteristics, and causing an audio track to play according to the adjusted equalization setting.

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20 Claims, 9 Drawing Sheets



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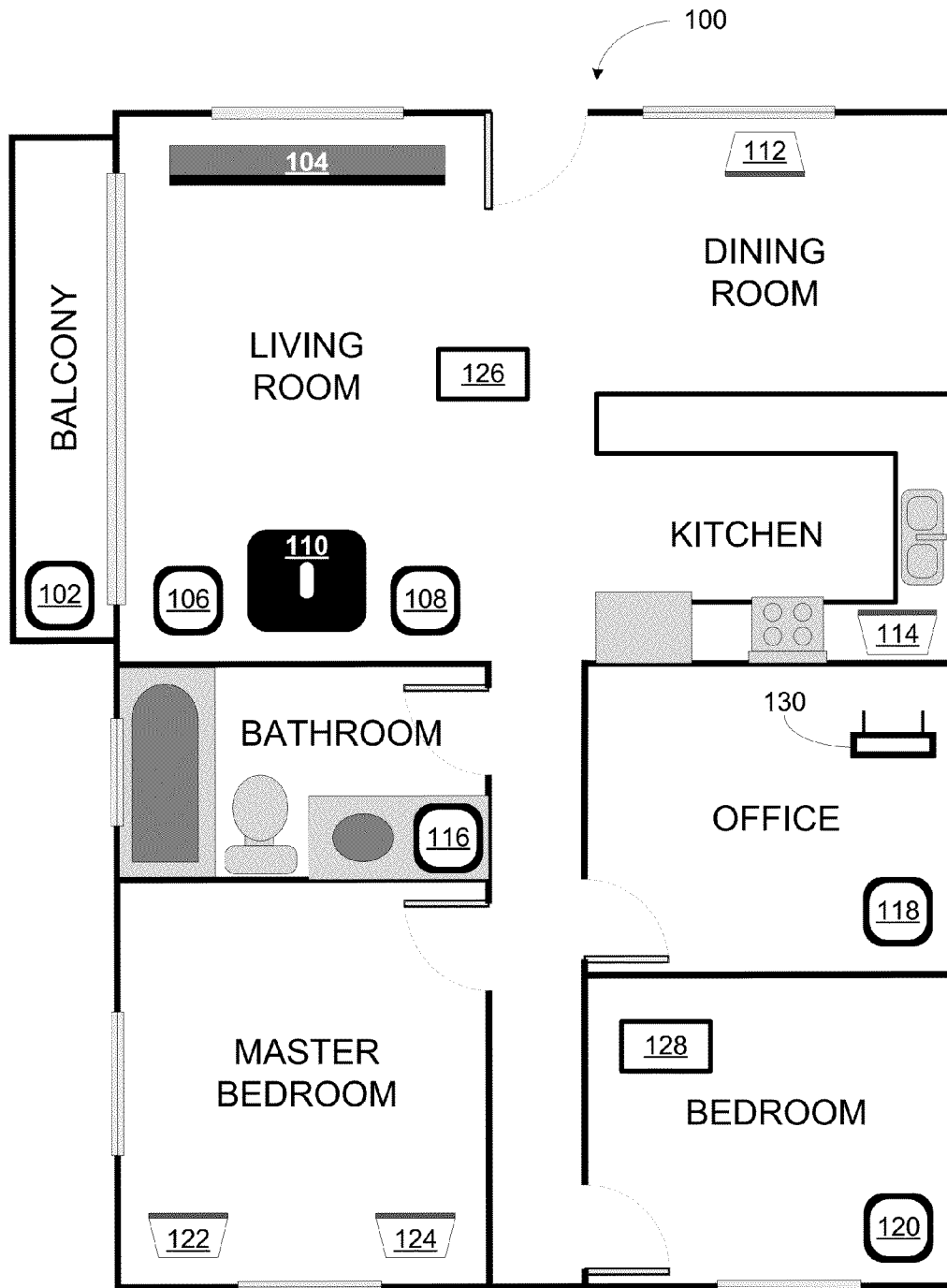


FIGURE 1

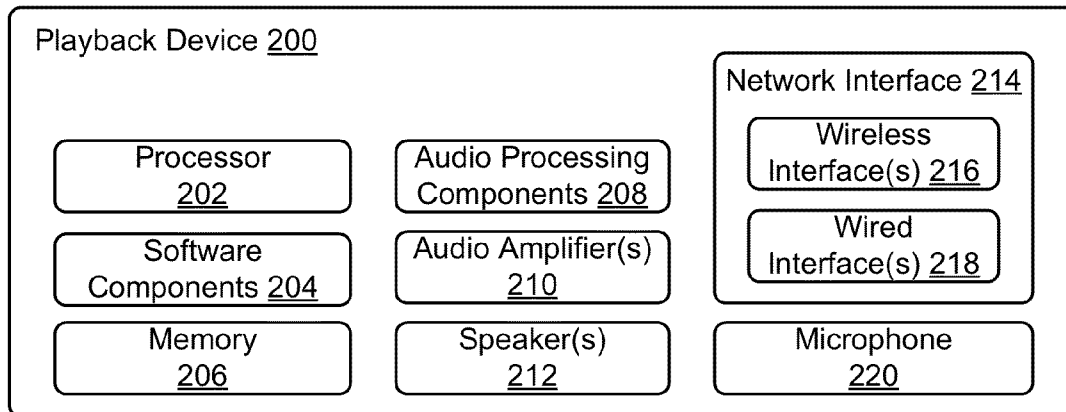


FIGURE 2

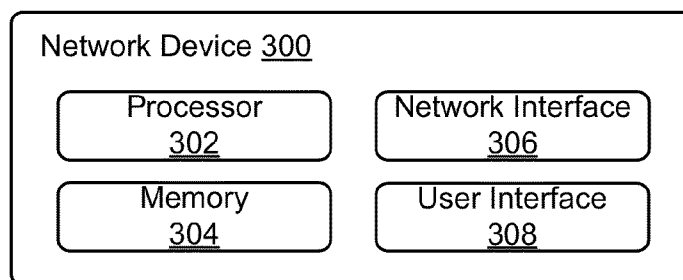


FIGURE 3

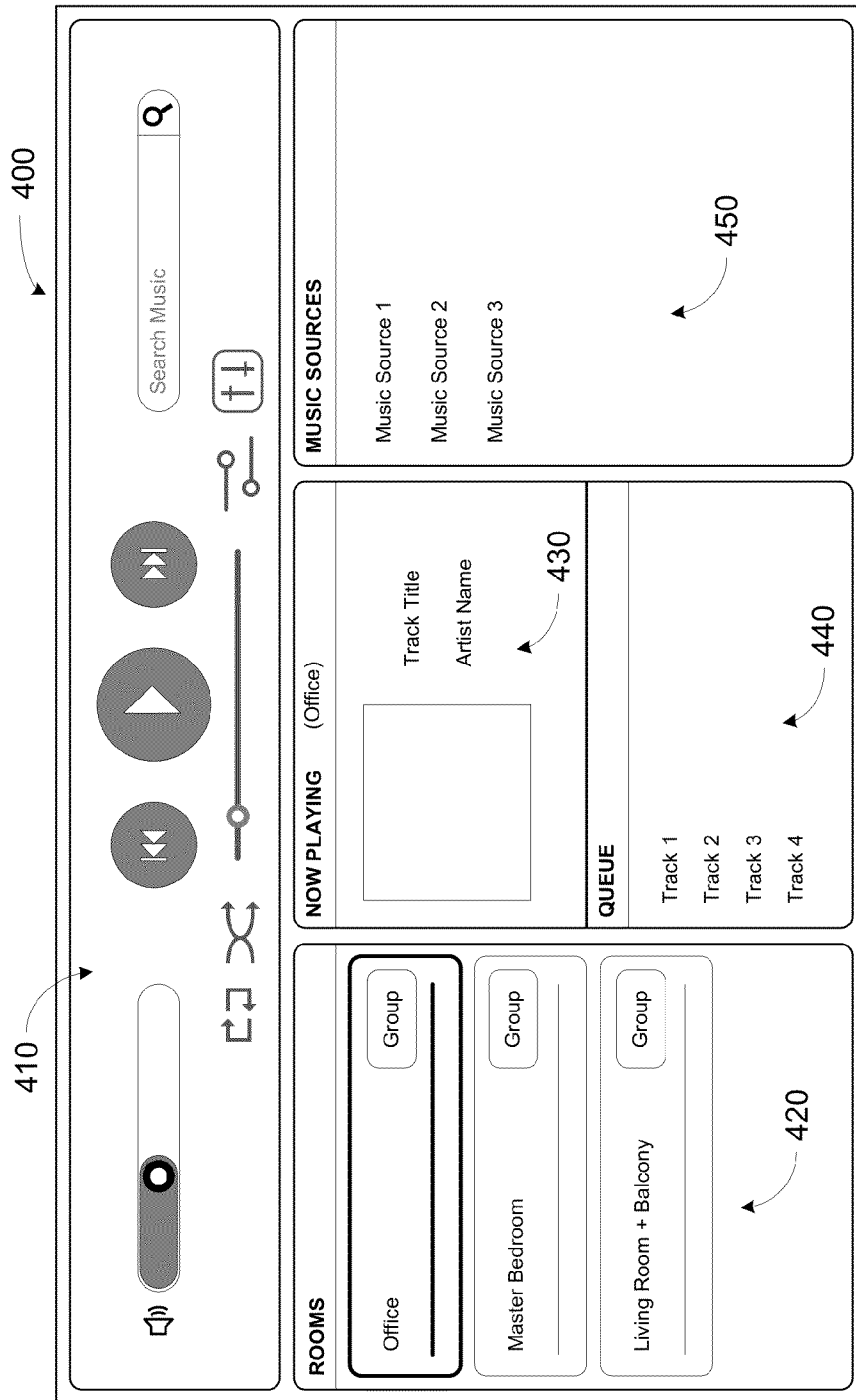


FIGURE 4

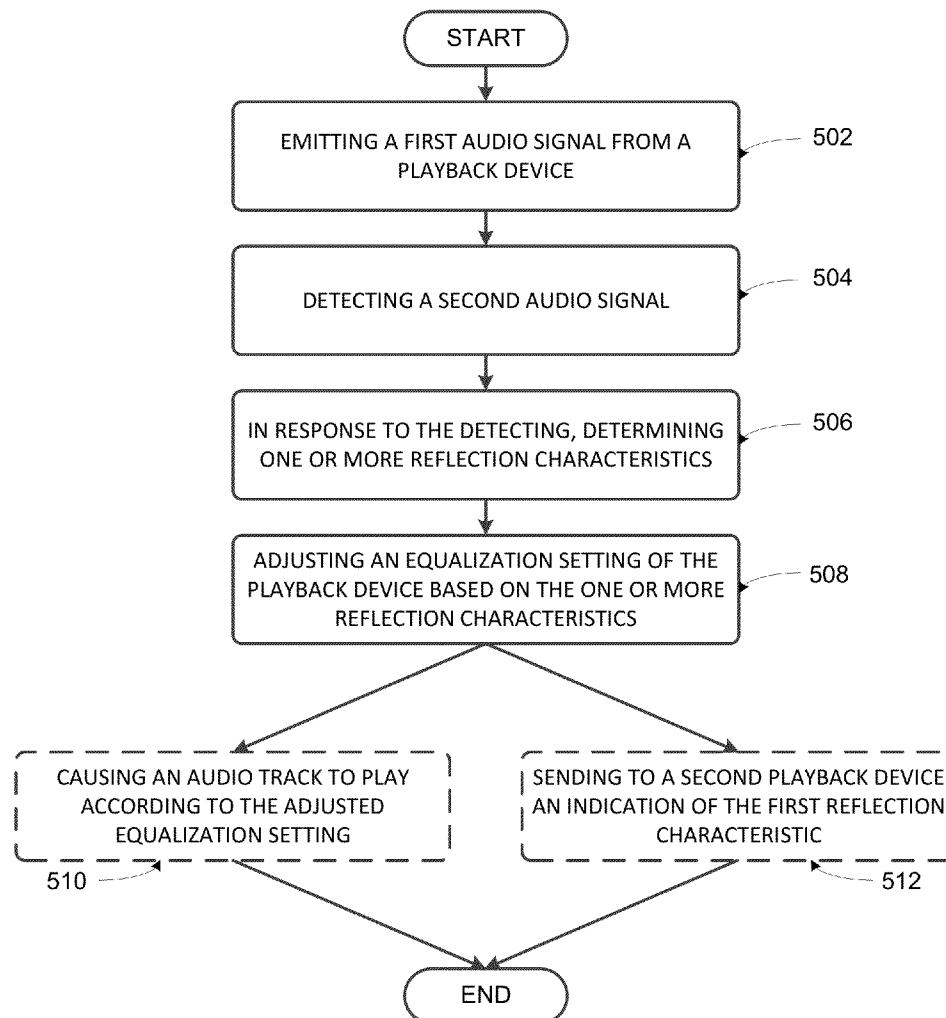


FIGURE 5

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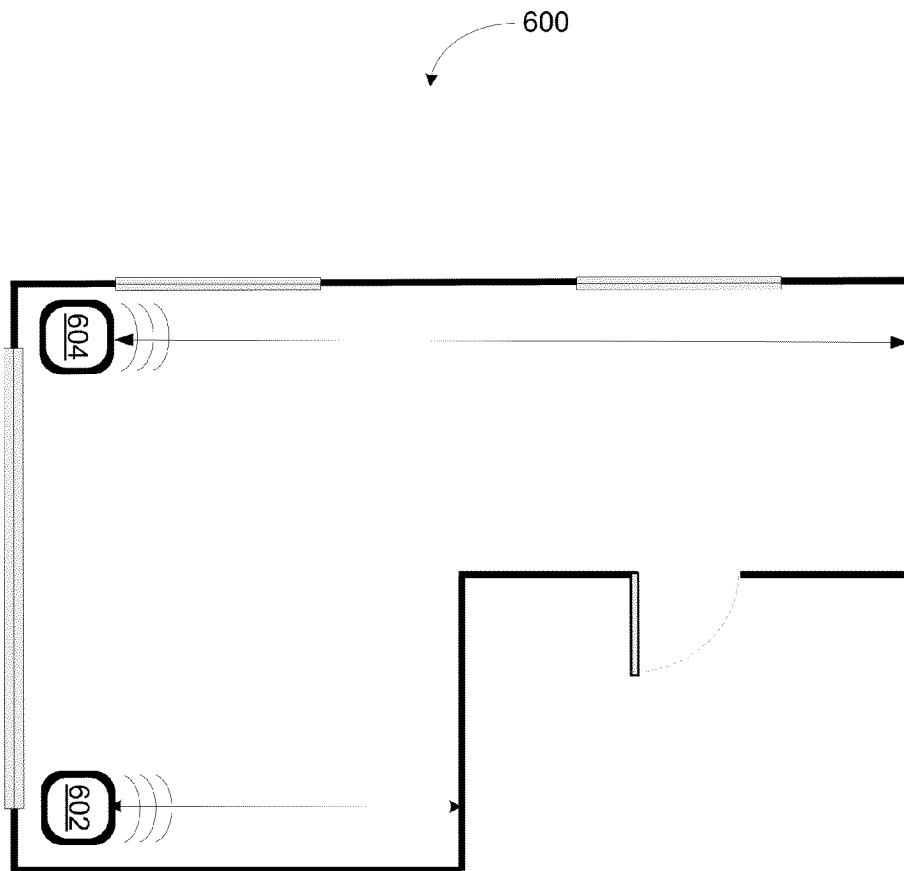


FIGURE 6

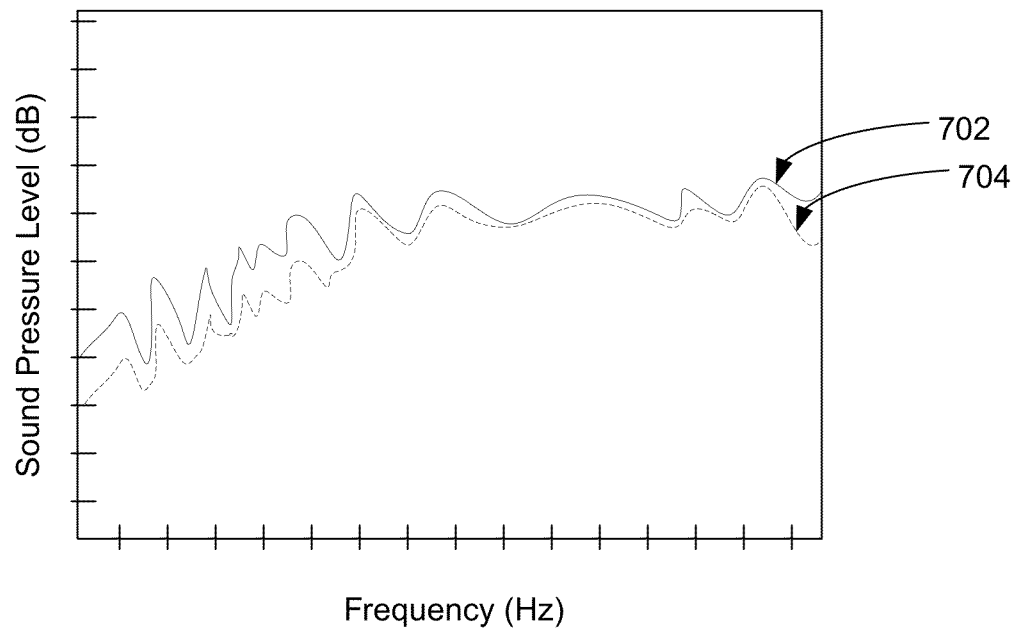


FIGURE 7

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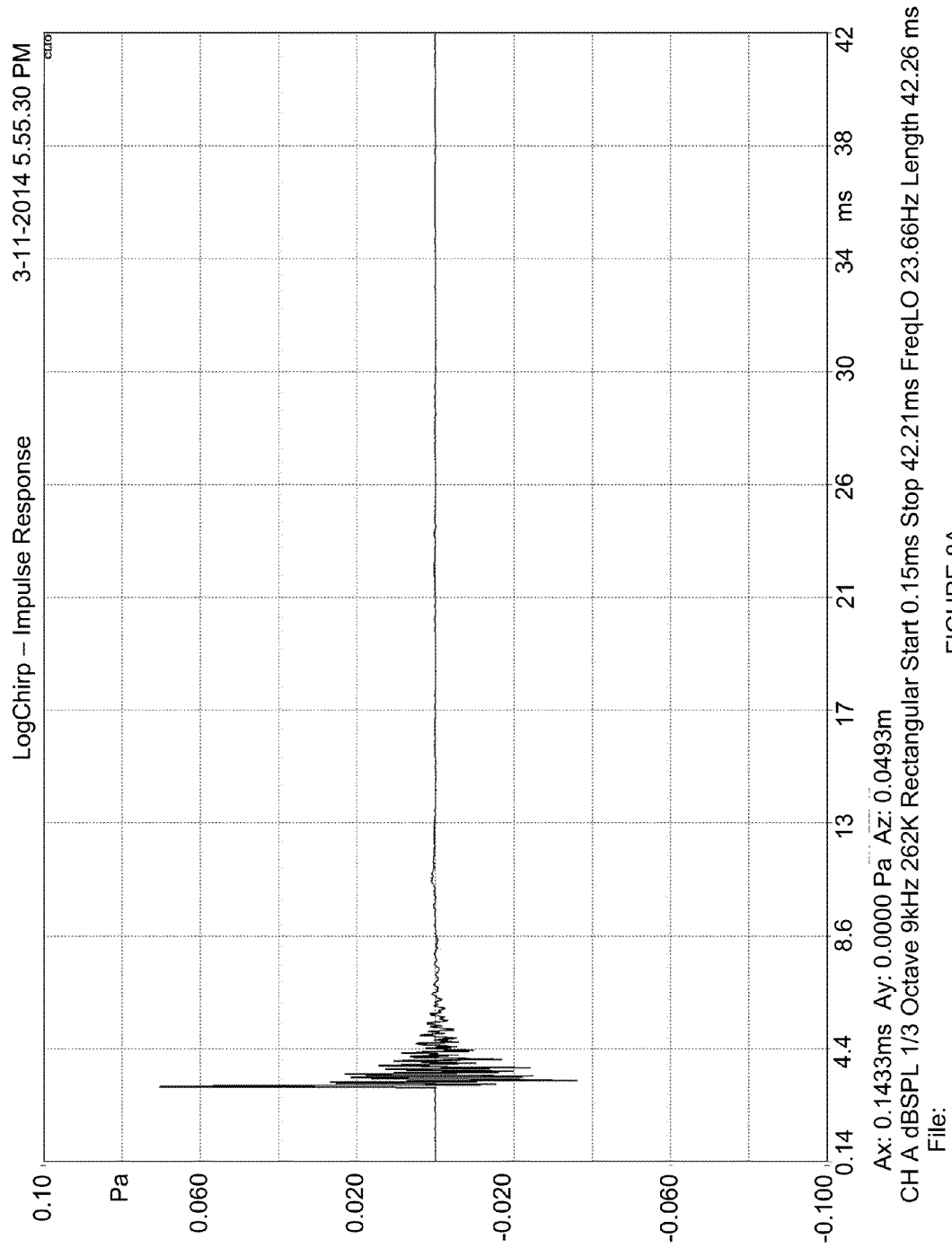


FIGURE 8A

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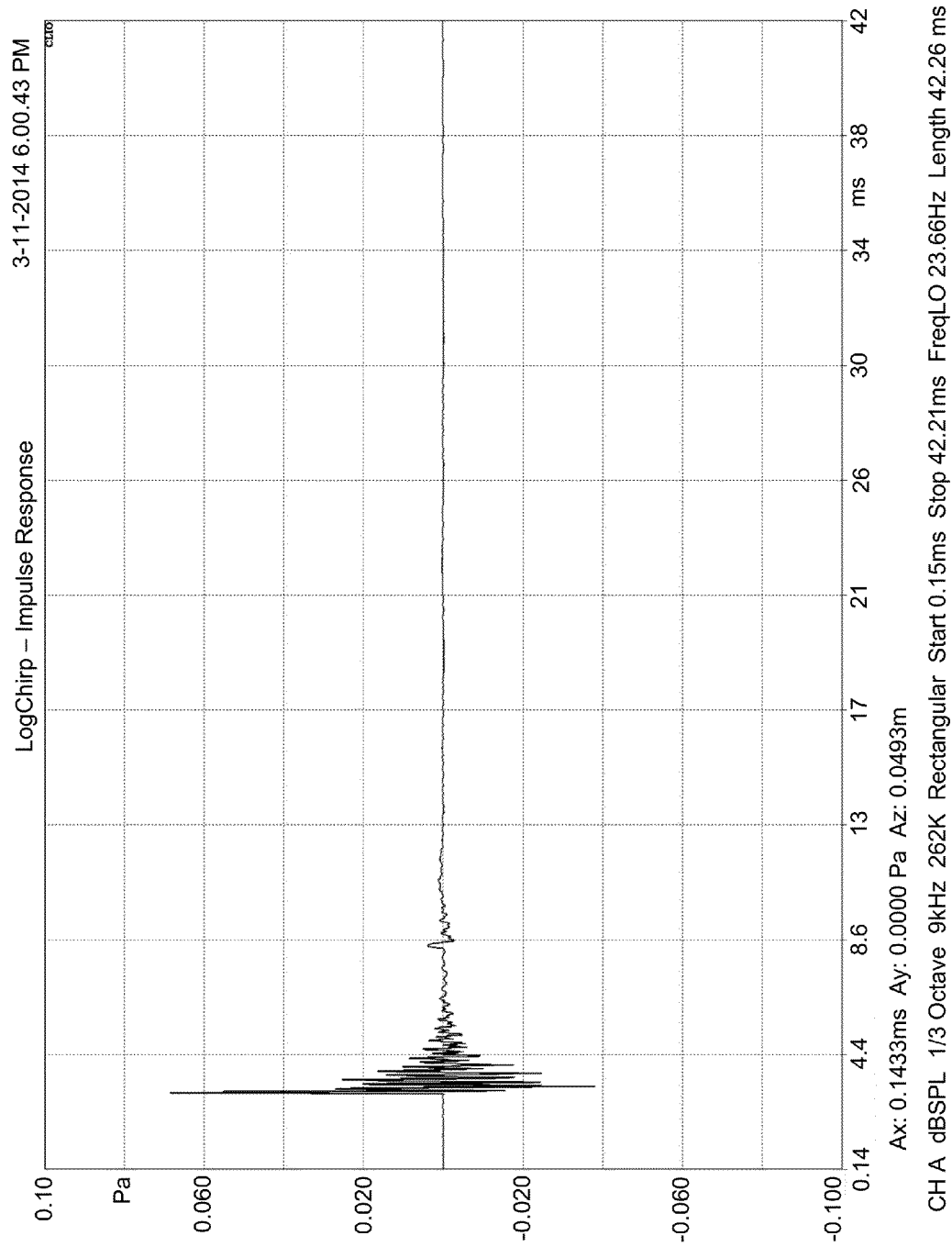


FIGURE 8B

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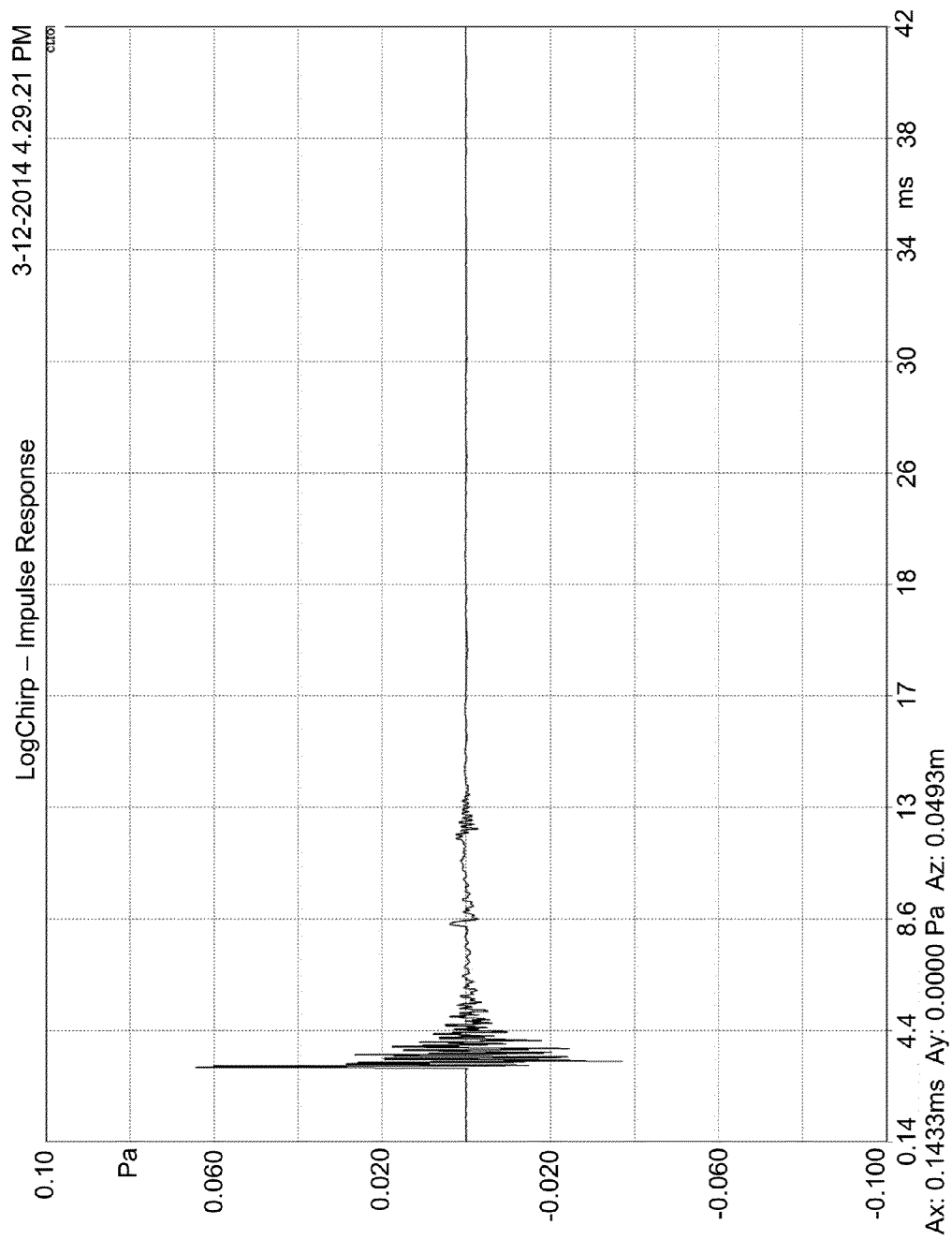


FIGURE 8C

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AUDIO SETTINGS BASED ON ENVIRONMENT**FIELD OF THE DISCLOSURE**

The disclosure is related to consumer goods and, more particularly, to methods, systems, products, features, services, and other elements directed to media playback or some aspect thereof.

BACKGROUND

Options for accessing and listening to digital audio in an out-loud setting were limited until in 2003, when SONOS, Inc. filed for one of its first patent applications, entitled “Method for Synchronizing Audio Playback between Multiple Networked Devices,” and began offering a media playback system for sale in 2005. The Sonos Wireless HiFi System enables people to experience music from many sources via one or more networked playback devices. Through a software control application installed on a smartphone, tablet, or computer, one can play what he or she wants in any room that has a networked playback device. Additionally, using the controller, for example, different songs can be streamed to each room with a playback device, rooms can be grouped together for synchronous playback, or the same song can be heard in all rooms synchronously.

Given the ever growing interest in digital media, there continues to be a need to develop consumer-accessible technologies to further enhance the listening experience.

BRIEF DESCRIPTION OF THE DRAWINGS

Features, aspects, and advantages of the presently disclosed technology may be better understood with regard to the following description, appended claims, and accompanying drawings where:

FIG. 1 shows an example media playback system configuration in which certain embodiments may be practiced;

FIG. 2 shows a functional block diagram of an example playback device;

FIG. 3 shows a functional block diagram of an example control device;

FIG. 4 shows an example controller interface;

FIG. 5 shows an example flow diagram for dynamically adjusting the equalization of a playback device based on the environment in which the playback device is operating;

FIG. 6 shows another example media playback system configuration in which certain embodiments may be practiced; and

FIG. 7 shows illustrative frequency responses of the playback device.

FIGS. 8A-8C show example impulse responses of a playback device.

The drawings are for the purpose of illustrating example embodiments, but it is understood that the inventions are not limited to the arrangements and instrumentality shown in the drawings.

DETAILED DESCRIPTION**I. Overview**

Embodiments described herein involve dynamically adjusting the equalization of a playback device based on the environment in which the playback device is operating. While a playback device may be factory configured to perform

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advantageously in a typical operating environment, the factory configuration may not be ideal for all environments. Therefore, adjusting the equalization of the playback device based on the current operating environment may improve the listening experience for some listeners.

Consider that, as one example, a playback device may be configured to perform advantageously in a small room, but nonetheless may come to be positioned outdoors. When operating outdoors, boosting the bass levels of the playback may result in an improved listening experience for some users. Other such examples may exist as well.

Some audio playback systems implement a manual approach for adjustment of equalization based on environment. Under this approach, a microphone is cabled to a given component of an audio system, such as an amplifier or an audio-video receiver. A user is then expected to position the microphone in a position in which the user would typically listen to the audio system. The given component of the audio system then drives audio output to one or more speakers. Then, the speaker output is detected by the microphone. Playback of the audio component is then adjusted based on the speaker output detected by the microphone.

Such a manual approach has several disadvantages. First, the adjustment process is often overlooked by the user because, for example, the user may be required to initiate the adjustment and position the microphone. Second, the adjustment process requires a separate microphone, which may not be included with any of the components of the audio system. Third, the manual approach does not lend itself to frequent adjustment when one or more of the speakers may be repositioned in different locations throughout a home or outdoors. Therefore, an improved, dynamic approach to adjustment based on environment is desired.

Described herein are example methods and systems for dynamically adjusting equalization of a playback device based on the environment in which the playback device is operating. An example playback device may include a speaker, a microphone, and a processor. The playback device may emit an audio signal, such as a pulse, from the speaker. As the audio signal propagates, the signal may encounter various objects, such as walls and furniture, throughout the environment. When an object is encountered, the object may variably reflect or absorb portions of the audio signal. For instance, when the audio signal encounters an interior wall, a portion of the audio signal may be reflected by the interior wall. The portion of the audio signal may then encounter other objects that variably reflect or absorb some of the portion in turn. At some point, a portion of the reflected audio signal may reflect back toward the playback device from which the audio signal was emitted. The microphone of the playback device may then detect at least a portion of the reflected audio signal.

In response to detecting the reflected audio signal, the playback device may determine one or more reflection characteristics based on the reflected audio signal. For example, the playback device may determine an amount of time from when the playback device emitted the first audio signal to when the playback device detected the reflected audio signal. The amount of time may indicate the nature of the environment. For instance, a relatively short amount of time may indicate that the playback device is in a small room while a relatively amount of time may indicate that the playback device is in a large room. Alternatively, the playback device may determine the sound pressure level of the second audio signal. A relatively low sound pressure level may indicate that there is relatively more absorptive material in the environment as compared with a relatively higher sound pressure

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level. Or the relatively low sound pressure level may indicate that the first audio signal travelled a relatively longer distance before reflecting. Other reflection characteristics may exist, as may many other examples of indications regarding the nature of the environment.

The playback device may then adjust an equalization setting of the playback device based on the one or more reflection characteristics. Further, two or more reflection characteristics may be used in combination. For instance, a relatively long amount of time and a relatively low sound pressure level may indicate that the playback device is either presumed to be outside or in a very large room. In either case, the playback device may adjust the equalization setting based on that environment. In the above instance, where the playback device is either outside or in a very large room, the bass frequencies of the playback device may be increased, which may, to some listeners, improve enjoyment of the audio played by the playback device in the more spacious environment. In contrast, where the reflection characteristics indicate that the playback device is in a small room, the bass frequencies of the playback device may be decreased, which may improve enjoyment of the audio played by the playback device in the small room. Once the equalization setting is adjusted, the playback device may then play an audio track according to the equalization setting.

As indicated above, the present application involves dynamically adjusting the equalization of a playback device based on the environment in which the playback device is operating. In one aspect, a method is provided. The method involves emitting, by a playback device, a first audio signal, detecting, by the playback device, a second audio signal, where at least a portion of the second audio signal is a reflection of the first audio signal, in response to the detecting, determining one or more reflection characteristics, where each of the one or more reflection characteristics are based on at least the second audio signal, adjusting an equalization setting of the playback device based on the one or more reflection characteristics; and causing an audio track to play according to the adjusted equalization setting.

In another aspect, a second method is provided. The second method is operable in a media playback system comprising a plurality of playback devices, where each playback device comprises a respective microphone and a respective speaker. The second method involves receiving an indication of a first audio signal, detecting, by a microphone of the first playback device, a second audio signal, where at least a portion of the second audio signal is indicative of the first audio signal, in response to the detecting, determining a first reflection characteristic based on the second audio signal, adjusting an equalization setting of the first playback device based on at least the first reflection characteristic, and sending to a second media playback device an indication of the first reflection characteristic.

In another aspect, a device is provided. The device includes a speaker, a microphone that is physically coupled to the speaker, a processor, a network interface, a data storage, and a program logic stored in the data storage. The program logic is executable by the processor to emit a first audio signal from the speaker, detect, via the microphone, a second audio signal, wherein at least a portion of the second audio signal is a reflection of the first audio signal, in response to the detecting, determine a first reflection characteristic based on at least the second audio signal, adjust an equalization setting of the playback device based on at least the first reflection characteristic, and play, via the speaker, an audio track according to the equalization setting.

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In yet another aspect, a non-transitory computer readable memory is provided. The non-transitory computer readable memory has stored thereon instructions executable by a computing device to cause the computing device to perform functions. The functions include emitting, by a playback device, a first audio signal, detecting, by the playback device, a second audio signal, wherein at least a portion of the second audio signal is a reflection of the first audio signal, in response to the detecting, determining one or more reflection characteristics, wherein each of the one or more reflection characteristics are based on at least the second audio signal, adjusting an equalization setting of the playback device based on the one or more reflection characteristics; and causing an audio track to play according to the adjusted equalization setting.

It will be understood by one of ordinary skill in the art that this disclosure includes numerous other embodiments.

II. Example Operating Environment

FIG. 1 shows an example configuration of a media playback system 100 in which one or more embodiments disclosed herein may be practiced or implemented. The media playback system 100 as shown is associated with an example home environment having several rooms and spaces, such as for example, a master bedroom, an office, a dining room, and a living room. As shown in the example of FIG. 1, the media playback system 100 includes playback devices 102-124, control devices 126 and 128, and a wired or wireless network router 130.

Further discussions relating to the different components of the example media playback system 100 and how the different components may interact to provide a user with a media experience may be found in the following sections. While discussions herein may generally refer to the example media playback system 100, technologies described herein are not limited to applications within, among other things, the home environment as shown in FIG. 1. For instance, the technologies described herein may be useful in environments where multi-zone audio may be desired, such as, for example, a commercial setting like a restaurant, mall or airport, a vehicle like a sports utility vehicle (SUV), bus or car, a ship or boat, an airplane, and so on.

a. Example Playback Devices

FIG. 2 shows a functional block diagram of an example playback device 200 that may be configured to be one or more of the playback devices 102-124 of the media playback system 100 of FIG. 1. The playback device 200 may include a processor 202, software components 204, memory 206, audio processing components 208, audio amplifier(s) 210, speaker(s) 212, a network interface 214 including wireless interface(s) 216 and wired interface(s) 218 and a microphone 220. In one case, the playback device 200 may not include the speaker(s) 212, but rather a speaker interface for connecting the playback device 200 to external speakers. In another case, the playback device 200 may include neither the speaker(s) 212 nor the audio amplifier(s) 210, but rather an audio interface for connecting the playback device 200 to an external audio amplifier or audio-visual receiver.

In one example, the processor 202 may be a clock-driven computing component configured to process input data according to instructions stored in the memory 206. The memory 206 may be a tangible computer-readable medium configured to store instructions executable by the processor 202. For instance, the memory 206 may be data storage that can be loaded with one or more of the software components 204 executable by the processor 202 to achieve certain functions. In one example, the functions may involve the playback

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device **200** retrieving audio data from an audio source or another playback device. In another example, the functions may involve the playback device **200** sending audio data to another device or playback device on a network. In yet another example, the functions may involve pairing of the playback device **200** with one or more playback devices to create a multi-channel audio environment.

Certain functions may involve the playback device **200** synchronizing playback of audio content with one or more other playback devices. During synchronous playback, a listener will preferably not be able to perceive time-delay differences between playback of the audio content by the playback device **200** and the one or more other playback devices. U.S. Pat. No. 8,234,395 entitled, "System and method for synchronizing operations among a plurality of independently clocked digital data processing devices," which is hereby incorporated by reference, provides in more detail some examples for audio playback synchronization among playback devices.

The memory **206** may further be configured to store data associated with the playback device **200**, such as one or more zones and/or zone groups the playback device **200** is a part of, audio sources accessible by the playback device **200**, or a playback queue that the playback device **200** (or some other playback device) may be associated with. The data may be stored as one or more state variables that are periodically updated and used to describe the state of the playback device **200**. The memory **206** may also include the data associated with the state of the other devices of the media system, and shared from time to time among the devices so that one or more of the devices have the most recent data associated with the system. Other embodiments are also possible.

The audio processing components **208** may include one or more digital-to-analog converters (DAC), an audio pre-processing component, an audio enhancement component or a digital signal processor (DSP), and so on. In one embodiment, one or more of the audio processing components **208** may be a subcomponent of the processor **202**. In one example, audio content may be processed and/or intentionally altered by the audio processing components **208** to produce audio signals. The produced audio signals may then be provided to the audio amplifier(s) **210** for amplification and playback through speaker(s) **212**. Particularly, the audio amplifier(s) **210** may include devices configured to amplify audio signals to a level for driving one or more of the speakers **212**. The speaker(s) **212** may include an individual transducer (e.g., a "driver") or a complete speaker system involving an enclosure with one or more drivers. A particular driver of the speaker(s) **212** may include, for example, a subwoofer (e.g., for low frequencies), a mid-range driver (e.g., for middle frequencies), and/or a tweeter (e.g., for high frequencies). In some cases, each transducer in the one or more speakers **212** may be driven by an individual corresponding audio amplifier of the audio amplifier(s) **210**. In addition to producing analog signals for playback by the playback device **200**, the audio processing components **208** may be configured to process audio content to be sent to one or more other playback devices for playback.

Audio content to be processed and/or played back by the playback device **200** may be received from an external source, such as via an audio line-in input connection (e.g., an auto-detecting 3.5 mm audio line-in connection) or the network interface **214**.

The network interface **214** may be configured to facilitate a data flow between the playback device **200** and one or more other devices on a data network. As such, the playback device **200** may be configured to receive audio content over the data network from one or more other playback devices in commu-

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nication with the playback device **200**, network devices within a local area network, or audio content sources over a wide area network such as the Internet. In one example, the audio content and other signals transmitted and received by the playback device **200** may be transmitted in the form of digital packet data containing an Internet Protocol (IP)-based source address and IP-based destination addresses. In such a case, the network interface **214** may be configured to parse the digital packet data such that the data destined for the playback device **200** is properly received and processed by the playback device **200**.

As shown, the network interface **214** may include wireless interface(s) **216** and wired interface(s) **218**. The wireless interface(s) **216** may provide network interface functions for the playback device **200** to wirelessly communicate with other devices (e.g., other playback device(s), speaker(s), receiver(s), network device(s), control device(s) within a data network the playback device **200** is associated with) in accordance with a communication protocol (e.g., any wireless standard including IEEE 802.11a, 802.11b, 802.11g, 802.11n, 802.11 ac, 802.15, 4G mobile communication standard, and so on). The wired interface(s) **218** may provide network interface functions for the playback device **200** to communicate over a wired connection with other devices in accordance with a communication protocol (e.g., IEEE 802.3). While the network interface **214** shown in FIG. 2 includes both wireless interface(s) **216** and wired interface(s) **218**, the network interface **214** may in some embodiments include only wireless interface(s) or only wired interface(s).

The microphone **220** may be arranged to detect sound in the environment of the playback device **200**. For instance, the microphone may be mounted on an exterior wall of a housing of the playback device. The microphone may be any type of microphone now known or later developed such as a condenser microphone, electret condenser microphone, or a dynamic microphone. The microphone may be sensitive to a portion of the frequency range of the speaker(s) **220**. One or more of the speaker(s) **220** may operate in reverse as the microphone **220**.

In one example, the playback device **200** and one other playback device may be paired to play two separate audio components of audio content. For instance, playback device **200** may be configured to play a left channel audio component, while the other playback device may be configured to play a right channel audio component, thereby producing or enhancing a stereo effect of the audio content. The paired playback devices (also referred to as "bonded playback devices") may further play audio content in synchrony with other playback devices.

In another example, the playback device **200** may be sonically consolidated with one or more other playback devices to form a single, consolidated playback device. A consolidated playback device may be configured to process and reproduce sound differently than an unconsolidated playback device or playback devices that are paired, because a consolidated playback device may have additional speaker drivers through which audio content may be rendered. For instance, if the playback device **200** is a playback device designed to render low frequency range audio content (i.e. a subwoofer), the playback device **200** may be consolidated with a playback device designed to render full frequency range audio content. In such a case, the full frequency range playback device, when consolidated with the low frequency playback device **200**, may be configured to render only the mid and high frequency components of audio content, while the low frequency range playback device **200** renders the low frequency component of the audio content. The consolidated playback

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device may further be paired with a single playback device or yet another consolidated playback device.

By way of illustration, SONOS, Inc. presently offers (or has offered) for sale certain playback devices including a “PLAY:1,” “PLAY:3,” “PLAY:5,” “PLAYBAR,” “CONNECT:AMP,” “CONNECT,” and “SUB.” Any other past, present, and/or future playback devices may additionally or alternatively be used to implement the playback devices of example embodiments disclosed herein. Additionally, it is understood that a playback device is not limited to the example illustrated in FIG. 2 or to the SONOS product offerings. For example, a playback device may include a wired or wireless headphone. In another example, a playback device may include or interact with a docking station for personal mobile media playback devices. In yet another example, a playback device may be integral to another device or component such as a television, a lighting fixture, or some other device for indoor or outdoor use.

b. Example Playback Zone Configurations

Referring back to the media playback system 100 of FIG. 1, the environment may have one or more playback zones, each with one or more playback devices. The media playback system 100 may be established with one or more playback zones, after which one or more zones may be added, or removed to arrive at the example configuration shown in FIG. 1. Each zone may be given a name according to a different room or space such as an office, bathroom, master bedroom, bedroom, kitchen, dining room, living room, and/or balcony. In one case, a single playback zone may include multiple rooms or spaces. In another case, a single room or space may include multiple playback zones.

As shown in FIG. 1, the balcony, dining room, kitchen, bathroom, office, and bedroom zones each have one playback device, while the living room and master bedroom zones each have multiple playback devices. In the living room zone, playback devices 104, 106, 108, and 110 may be configured to play audio content in synchrony as individual playback devices, as one or more bonded playback devices, as one or more consolidated playback devices, or any combination thereof. Similarly, in the case of the master bedroom, playback devices 122 and 124 may be configured to play audio content in synchrony as individual playback devices, as a bonded playback device, or as a consolidated playback device.

In one example, one or more playback zones in the environment of FIG. 1 may each be playing different audio content. For instance, the user may be grilling in the balcony zone and listening to hip hop music being played by the playback device 102 while another user may be preparing food in the kitchen zone and listening to classical music being played by the playback device 114. In another example, a playback zone may play the same audio content in synchrony with another playback zone. For instance, the user may be in the office zone where the playback device 118 is playing the same rock music that is being played by playback device 102 in the balcony zone. In such a case, playback devices 102 and 118 may be playing the rock music in synchrony such that the user may seamlessly (or at least substantially seamlessly) enjoy the audio content that is being played out-loud while moving between different playback zones. Synchronization among playback zones may be achieved in a manner similar to that of synchronization among playback devices, as described in previously referenced U.S. Pat. No. 8,234,395.

As suggested above, the zone configurations of the media playback system 100 may be dynamically modified, and in some embodiments, the media playback system 100 supports numerous configurations. For instance, if a user physically

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moves one or more playback devices to or from a zone, the media playback system 100 may be reconfigured to accommodate the change(s). For instance, if the user physically moves the playback device 102 from the balcony zone to the office zone, the office zone may now include both the playback device 118 and the playback device 102. The playback device 102 may be paired or grouped with the office zone and/or renamed if so desired via a control device such as the control devices 126 and 128. On the other hand, if the one or more playback devices are moved to a particular area in the home environment that is not already a playback zone, a new playback zone may be created for the particular area.

Further, different playback zones of the media playback system 100 may be dynamically combined into zone groups or split up into individual playback zones. For instance, the dining room zone and the kitchen zone 114 may be combined into a zone group for a dinner party such that playback devices 112 and 114 may render audio content in synchrony. On the other hand, the living room zone may be split into a television zone including playback device 104, and a listening zone including playback devices 106, 108, and 110, if the user wishes to listen to music in the living room space while another user wishes to watch television.

c. Example Control Devices

FIG. 3 shows a functional block diagram of an example control device 300 that may be configured to be one or both of the control devices 126 and 128 of the media playback system 100. As shown, the control device 300 may include a processor 302, memory 304, a network interface 306, and a user interface 308. In one example, the control device 300 may be a dedicated controller for the media playback system 100. In another example, the control device 300 may be a network device on which media playback system controller application software may be installed, such as for example, an iPhone™ iPad™ or any other smart phone, tablet or network device (e.g., a networked computer such as a PC or Mac™).

The processor 302 may be configured to perform functions relevant to facilitating user access, control, and configuration of the media playback system 100. The memory 304 may be configured to store instructions executable by the processor 302 to perform those functions. The memory 304 may also be configured to store the media playback system controller application software and other data associated with the media playback system 100 and the user.

In one example, the network interface 306 may be based on an industry standard (e.g., infrared, radio, wired standards including IEEE 802.3, wireless standards including IEEE 802.11a, 802.11b, 802.11g, 802.11n, 802.11ac, 802.15, 4G mobile communication standard, and so on). The network interface 306 may provide a means for the control device 300 to communicate with other devices in the media playback system 100. In one example, data and information (e.g., such as a state variable) may be communicated between control device 300 and other devices via the network interface 306. For instance, playback zone and zone group configurations in the media playback system 100 may be received by the control device 300 from a playback device or another network device, or transmitted by the control device 300 to another playback device or network device via the network interface 306. In some cases, the other network device may be another control device.

Playback device control commands such as volume control and audio playback control may also be communicated from the control device 300 to a playback device via the network interface 306. As suggested above, changes to configurations of the media playback system 100 may also be performed by a user using the control device 300. The configuration

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changes may include adding/removing one or more playback devices to/from a zone, adding/removing one or more zones to/from a zone group, forming a bonded or consolidated player, separating one or more playback devices from a bonded or consolidated player, among others. Accordingly, the control device 300 may sometimes be referred to as a controller, whether the control device 300 is a dedicated controller or a network device on which media playback system controller application software is installed.

The user interface 308 of the control device 300 may be configured to facilitate user access and control of the media playback system 100, by providing a controller interface such as the controller interface 400 shown in FIG. 4. The controller interface 400 includes a playback control region 410, a playback zone region 420, a playback status region 430, a playback queue region 440, and an audio content sources region 450. The user interface 400 as shown is just one example of a user interface that may be provided on a network device such as the control device 300 of FIG. 3 (and/or the control devices 126 and 128 of FIG. 1) and accessed by users to control a media playback system such as the media playback system 100. Other user interfaces of varying formats, styles, and interactive sequences may alternatively be implemented on one or more network devices to provide comparable control access to a media playback system.

The playback control region 410 may include selectable (e.g., by way of touch or by using a cursor) icons to cause playback devices in a selected playback zone or zone group to play or pause, fast forward, rewind, skip to next, skip to previous, enter/exit shuffle mode, enter/exit repeat mode, enter/exit cross fade mode. The playback control region 410 may also include selectable icons to modify equalization settings, and playback volume, among other possibilities.

The playback zone region 420 may include representations of playback zones within the media playback system 100. In some embodiments, the graphical representations of playback zones may be selectable to bring up additional selectable icons to manage or configure the playback zones in the media playback system, such as a creation of bonded zones, creation of zone groups, separation of zone groups, and renaming of zone groups, among other possibilities.

For example, as shown, a “group” icon may be provided within each of the graphical representations of playback zones. The “group” icon provided within a graphical representation of a particular zone may be selectable to bring up options to select one or more other zones in the media playback system to be grouped with the particular zone. Once grouped, playback devices in the zones that have been grouped with the particular zone will be configured to play audio content in synchrony with the playback device(s) in the particular zone. Analogously, a “group” icon may be provided within a graphical representation of a zone group. In this case, the “group” icon may be selectable to bring up options to deselect one or more zones in the zone group to be removed from the zone group. Other interactions and implementations for grouping and ungrouping zones via a user interface such as the user interface 400 are also possible. The representations of playback zones in the playback zone region 420 may be dynamically updated as playback zone or zone group configurations are modified.

The playback status region 430 may include graphical representations of audio content that is presently being played, previously played, or scheduled to play next in the selected playback zone or zone group. The selected playback zone or zone group may be visually distinguished on the user interface, such as within the playback zone region 420 and/or the playback status region 430. The graphical representations

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may include track title, artist name, album name, album year, track length, and other relevant information that may be useful for the user to know when controlling the media playback system via the user interface 400.

The playback queue region 440 may include graphical representations of audio content in a playback queue associated with the selected playback zone or zone group. In some embodiments, each playback zone or zone group may be associated with a playback queue containing information corresponding to zero or more audio items for playback by the playback zone or zone group. For instance, each audio item in the playback queue may comprise a uniform resource identifier (URI), a uniform resource locator (URL) or some other identifier that may be used by a playback device in the playback zone or zone group to find and/or retrieve the audio item from a local audio content source or a networked audio content source, possibly for playback by the playback device.

In one example, a playlist may be added to a playback queue, in which case information corresponding to each audio item in the playlist may be added to the playback queue. In another example, audio items in a playback queue may be saved as a playlist. In a further example, a playback queue may be empty, or populated but “not in use” when the playback zone or zone group is playing continuously streaming audio content, such as Internet radio that may continue to play until otherwise stopped, rather than discrete audio items that have playback durations. In an alternative embodiment, a playback queue can include Internet radio and/or other streaming audio content items and be “in use” when the playback zone or zone group is playing those items. Other examples are also possible.

When playback zones or zone groups are “grouped” or “ungrouped,” playback queues associated with the affected playback zones or zone groups may be cleared or re-associated. For example, if a first playback zone including a first playback queue is grouped with a second playback zone including a second playback queue, the established zone group may have an associated playback queue that is initially empty, that contains audio items from the first playback queue (such as if the second playback zone was added to the first playback zone), that contains audio items from the second playback queue (such as if the first playback zone was added to the second playback zone), or a combination of audio items from both the first and second playback queues. Subsequently, if the established zone group is ungrouped, the resulting first playback zone may be re-associated with the previous first playback queue, or be associated with a new playback queue that is empty or contains audio items from the playback queue associated with the established zone group before the established zone group was ungrouped. Similarly, the resulting second playback zone may be re-associated with the previous second playback queue, or be associated with a new playback queue that is empty, or contains audio items from the playback queue associated with the established zone group before the established zone group was ungrouped. Other examples are also possible.

Referring back to the user interface 400 of FIG. 4, the graphical representations of audio content in the playback queue region 440 may include track titles, artist names, track lengths, and other relevant information associated with the audio content in the playback queue. In one example, graphical representations of audio content may be selectable to bring up additional selectable icons to manage and/or manipulate the playback queue and/or audio content represented in the playback queue. For instance, a represented audio content may be removed from the playback queue, moved to a different position within the playback queue, or

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selected to be played immediately, or after any currently playing audio content, among other possibilities. A playback queue associated with a playback zone or zone group may be stored in a memory on one or more playback devices in the playback zone or zone group, on a playback device that is not in the playback zone or zone group, and/or some other designated device.

The audio content sources region **450** may include graphical representations of selectable audio content sources from which audio content may be retrieved and played by the selected playback zone or zone group. Discussions pertaining to audio content sources may be found in the following section.

d. Example Audio Content Sources

As indicated previously, one or more playback devices in a zone or zone group may be configured to retrieve for playback audio content (e.g. according to a corresponding URI or URL for the audio content) from a variety of available audio content sources. In one example, audio content may be retrieved by a playback device directly from a corresponding audio content source (e.g., a line-in connection). In another example, audio content may be provided to a playback device over a network via one or more other playback devices or network devices.

Example audio content sources may include a memory of one or more playback devices in a media playback system such as the media playback system **100** of FIG. **1**, local music libraries on one or more network devices (such as a control device, a network-enabled personal computer, or a networked-attached storage (NAS), for example), streaming audio services providing audio content via the Internet (e.g., the cloud), or audio sources connected to the media playback system via a line-in input connection on a playback device or network device, among other possibilities.

In some embodiments, audio content sources may be regularly added or removed from a media playback system such as the media playback system **100** of FIG. **1**. In one example, an indexing of audio items may be performed whenever one or more audio content sources are added, removed or updated. Indexing of audio items may involve scanning for identifiable audio items in all folders/directory shared over a network accessible by playback devices in the media playback system, and generating or updating an audio content database containing metadata (e.g., title, artist, album, track length, among others) and other associated information, such as a URI or URL for each identifiable audio item found. Other examples for managing and maintaining audio content sources may also be possible.

The above discussions relating to playback devices, controller devices, playback zone configurations, and media content sources provide only some examples of operating environments within which functions and methods described below may be implemented. Other operating environments and configurations of media playback systems, playback devices, and network devices not explicitly described herein may also be applicable and suitable for implementation of the functions and methods.

III. Example Method for Adjusting Equalization Based on Environment

As discussed above, embodiments described herein may involve dynamically adjusting the equalization of a playback device based on the environment in which the playback device is operating.

Method **500** shown in FIG. **5** presents an embodiment of a method that can be implemented within an operating envi-

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ronment involving, for example, the media playback system **100** of FIG. **1**, one or more of the playback device **200** of FIG. **2**, and one or more of the control device **300** of FIG. **3**. Method **500** may include one or more operations, functions, or actions as illustrated by one or more of blocks **502-510**. Although the blocks are illustrated in sequential order, these blocks may also be performed in parallel, and/or in a different order than those described herein. Also, the various blocks may be combined into fewer blocks, divided into additional blocks, and/or removed based upon the desired implementation.

In addition, for the method **500** and other processes and methods disclosed herein, the flowchart shows functionality and operation of one possible implementation of present embodiments. In this regard, each block may represent a module, a segment, or a portion of program code, which includes one or more instructions executable by a processor for implementing specific logical functions or steps in the process. The program code may be stored on any type of computer readable medium, for example, such as a storage device including a disk or hard drive. The computer readable medium may include non-transitory computer readable medium, for example, such as computer-readable media that stores data for short periods of time like register memory, processor cache and Random Access Memory (RAM). The computer readable medium may also include non-transitory media, such as secondary or persistent long term storage, like read only memory (ROM), optical or magnetic disks, compact-disc read only memory (CD-ROM), for example. The computer readable media may also be any other volatile or non-volatile storage systems. The computer readable medium may be considered a computer readable storage medium, for example, or a tangible storage device. In addition, for the method **500** and other processes and methods disclosed herein, each block in FIG. **5** may represent circuitry that is wired to perform the specific logical functions in the process.

a. Emitting a First Audio Signal from a Playback Device.

At block **502**, the playback device emits a first audio signal from the playback device. For instance, playback device **200** of FIG. **2** may output the first audio signal from speaker(s) **212**.

The first audio signal may take a variety of different forms. For instance, the first audio signal may include a pulse. Such a pulse may be a recording of a brief audio pulse that approximates an audio impulse signal. Some examples include recordings of an electric spark, a starter pistol shot, or the bursting of a balloon. In some examples, the first audio signal may include a signal that varies over frequency, such as a logarithmic chirp, a sine sweep, a pink noise signal, or a maximum length sequence. Such signals may be chosen for relatively broader-range coverage of the frequency spectrum or for other reasons. The first audio signal may involve other types of audio signals as well.

The first audio signal may have a particular waveform. For instance, the waveform may correspond to any of these example audio signals described above, such as, an electric spark, a starter pistol shot, or the bursting of a balloon. Such a waveform may be represented digitally, such as in an array of data points (i.e. samples) representing the changes in sound pressure over time. The waveform of the first audio signal may be referred to as the first waveform.

The playback device may store the first audio signal as a recording. Then, when emitting the first audio signal, the playback device may playback the recording. The recording may take a variety of audio file formats, such as a waveform audio file format (WAV) or an MPEG-2 audio layer III (MP3), among other examples.

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Alternatively, the playback device may dynamically generate the first audio signal. For instance, the playback device may generate a signal that varies over frequency according to a mathematical equation. Other examples are possible as well.

The playback device may emit the first audio signal at a particular sound pressure level (i.e. magnitude). The particular sound pressure level may reflect the peak magnitude of the first audio signal. For instance, the playback device may emit a pulse signal having a peak magnitude of 60 dB (with reference to 20 μ Pa). The sound pressure level may be configurable. For instance, user input to playback device **200** (or a controller thereof, such as network device **300**) may configure the sound pressure of the first audio signal at a particular sound pressure level. Alternatively, the sound pressure level may be pre-determined.

The playback device may emit the first audio signal in response to a trigger. Further, the trigger may cause the playback device to carry out additional functions of the present method. For instance, user input to playback device **200** (or a controller thereof, such as network device **300**) may trigger playback device **200** to carry out the present method to adjust the equalization of the playback device. As another example, movement of the playback device (i.e. a change of positioning or in location) may trigger the playback device **200** to carry out the present method. The playback device may detect such a movement via an accelerometer. Other types of triggers are possible as well.

As described above, the playback device may be arranged as part of a media playback system that may include a plurality of playback devices. Each playback device of the media playback system may emit a respective first audio signal. Further, each playback device may perform one or more of the functions described below. For instance, each playback device may emit a respective first audio signal, detect a respective second audio signal, determine one or more respective reflection characteristics, adjust an equalization setting, and cause an audio track to play.

In one instance, a media playback system may include a first playback device and a second playback device. The first playback device may emit the first audio signal and then detect the second audio signal (as discussed below). In addition, the second playback device may emit a third audio signal. The third audio signal may take a variety of forms, including, for instance, any of the example audio signals described above in relation to the first audio signal. In some embodiments, the second playback device may emit the third audio signal in response to receiving an instruction, from the first playback device, to emit the third audio signal. Alternatively, the second playback device may receive the instruction from a controller. Other examples are possible as well.

b. Detecting, by the Playback Device, a Second Audio Signal.

At block **504**, the playback device detects, by a microphone, a second audio signal. A portion of the second audio signal may be a reflection of the first audio signal. For instance, playback device **200** may emit the first audio signal, the first audio signal may reflect off of one or more objects (collectively these reflections may be referred to as reverberation), and microphone **220** may detect these reflections as the second audio signal. Another portion of the second audio signal may be a direct propagation of the first audio signal.

The microphone may be communicatively coupled to the processor. For instance, microphone **220** may be coupled to an analog input of processor **202** of playback device **200**. Alternatively, microphone **220** may be coupled to an analog-to-digital converter that is coupled, in turn, to processor **202**. Other arrangements are possible as well.

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Detecting the second audio signal may involve recording the second audio signal. For instance, processor **202** may record the second audio signal and then store the second audio signal in memory **206**. Processor **202** may begin recording when the speaker emits the first audio signal. Alternatively, processor **202** may begin recording before or after the speaker emits the first audio signal such that reflections of the first audio signal may be detected by the microphone. The recording may be represented digitally, such as in an array of data points (i.e. samples) representing the changes in sound pressure over time. Further, the second audio signal may have a waveform that may be referred to as the second waveform.

In some circumstances, the second audio signal may include environmental noise. In some circumstances, significant environmental noise within the second audio signal may interfere with or otherwise affect determining the one or more reflection characteristics. For instance, environmental noise may mask or degrade the first audio signal, which may cause the playback device to determine one or more reflection characteristics that may not accurately reflect the environment because of the degradation caused by the environmental noise. Further, in some circumstances, an aspect of the environmental noise may be incorrectly detected as the first audio signal. While the second audio signal may include, as one portion, some background noise, the intention is that at least a portion of the second audio signal is the reflection of the first audio signal.

Accordingly, to reduce the possible effects of environmental noise, detecting the second audio signal may involve determining that the portion of the second audio signal is the reflection of the first audio signal based on the first waveform and the second waveform. For instance, the processor **202** may determine a difference between the first waveform and the second waveform by comparing the two waveforms. The playback device may then determine that the difference is less than a threshold which may indicate that the portion of the second audio signal is the reflection of the first audio signal. The threshold may be set such that a particular degree of similarity between the first waveform and the second waveform indicates that the portion of the second audio signal is a reflection of the first audio signal. Alternatively, several characteristics of the first waveform, such as the magnitude and duration, may be predetermined. The playback device may determine the same characteristics of the second waveform and compare the characteristics to determine that the portion of the second audio signal is the reflection of the first audio signal. As another example, the playback device may perform a deconvolution determination using the first audio signal and the second audio signal. Some embodiments may involve repeating the process described herein to reduce any effect caused by noise in a particular iteration.

The processor may determine the sound pressure level (i.e. magnitude) of the second audio signal. The sound pressure level of the second audio signal may be determined at each point along the waveform of the second audio signal or the sound pressure level may be determined at a subset of points, such as at the point having peak magnitude. For instance, the processor may determine that the second audio signal has a peak magnitude of 50 dB.

In some embodiments, the speaker and microphone may be physically coupled. For instance, a housing may contain both the speaker and the microphone. Further, the housing may additionally contain one or more other components of the playback device, such as a processor, a memory, a network interface, an audio amplifier(s), and/or various audio processing components. Therefore, in one embodiment, playback device **200** may include, within the same housing, processor

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202, software components 204, memory 206, audio processing components 208, audio amplifier(s) 210, speaker(s) 212, a network interface 214 including wireless interface(s) 216 and wired interface(s) 218 and a microphone 220. The housing may be a speaker cabinet. Other arrangements are possible as well.

As noted above, in some embodiments, the playback device may be arranged as part of a media playback system that includes two or more playback devices. In such embodiments, the playback device may detect audio signals emitted by other playback devices (as an alternative to or in addition to detecting the second audio signal). Referring to the example media playback system above that includes the first playback device and the second playback device, after the second playback device emits a third audio signal, the first playback device may detect the third audio signal and/or reflections thereof as a fourth audio signal. In some embodiments, the first playback device may then determine that at least a portion of the fourth audio signal is the third audio signal (or a reflection thereof) using, for example, any of the techniques described above.

Detecting audio signals emitted by other playback devices may include functions similar to those of detecting the second audio signal. Further, devices within the media playback system may exchange messages to coordinate the functions described herein. For instance, as noted above, a first playback device may trigger a second playback device to emit a third audio signal. As another example, the second playback device may send an indication of the third audio signal to the first playback device. The indication may assist the first playback device in determining that a portion of the fourth audio signal is the third audio signal (or a reflection thereof), for example. Alternatively, receiving the indication may trigger the first playback device to start listening for an audio signal from the second playback device.

In some embodiments, the first media playback may detect a plurality of audio signals. For instance, the plurality of audio signals may include a reflection of a signal emitted by the first playback device. The plurality of audio signals may also include signals (or reflections thereof) emitted by other playback devices within the media playback system. Other examples are possible as well.

c. Determining One or More Reflection Characteristics.

At block 506, the playback device determines one or more reflection characteristics. Each of the one or more reflection characteristics may indicate an aspect of the environment surrounding the playback device. For instance, one reflection characteristic may indicate that the playback device is inside, or that the playback device is outside. The reflection characteristic may also indicate a relative size of the room that the playback device is currently located within. Another reflection characteristic may indicate the amount of sound absorbing material in the environment. A third reflection characteristic may indicate one or more resonant frequencies of the environment. Many examples are possible.

In some embodiments, each of the one or more reflection characteristics may be based on at least the second audio signal. For instance, the processor 202 may determine one or more reflection characteristics based on the recording of the second audio signal. The one or more reflection characteristics may be further based on the first audio signal such as in a comparison of the second audio signal to the first audio signal.

One of the one or more reflection characteristics may be an amount of time elapsed from emitting the first audio signal to detecting the second audio signal. For instance, the processor 202 may assign to the first audio signal a first timestamp at the

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time of emitting the first audio signal and may further assign to the second audio signal a second time stamp at the time of detecting the second audio signal. The processor 202 may then determine a difference between the second time stamp and the first time stamp. Since each of the first audio signal and the second audio signal may be emitted and detected, respectively, over a duration of time, the time stamp may be assigned to a particular point in each of the first audio signal and the second audio signal. For instance, the time stamp may be assigned to the respective peaks of the first and second audio signals.

The reflection characteristic may be a qualitative characteristic. For instance, the qualitative characteristic may describe different types of operating environments, such as a “small room,” a “large room,” or “outdoors.” The qualitative characteristic may be based upon a quantitative value, such as an amount of time elapsed from emitting the first signal to detecting the second audio signal. For example, the playback device may determine the qualitative characteristic (e.g. “small room,” “large room,” or “outdoors”) based on a range of values for the amount of time elapsed from emitting the first signal. For example, an amount of time elapsed from emitting the first signal to detecting the second audio signal of 15-20 milliseconds (ms) may indicate a “small room,” 20-30 ms may indicate a “large room,” and an amount of time greater than 30 ms may indicate “outdoors.”

The qualitative characteristics may describe additional features of the room. For instance, the qualitative characteristic may describe a number of objects within the room. Alternatively, the qualitative characteristic may further describe the shape of the room. For example, a qualitative characteristic may indicate “high ceilings” in a “small room” or that the room is relatively much longer than it is wide (i.e. the room is long and narrow).

One or more of the reflection characteristics may relate to a frequency response of a system that includes the playback device and the environment surrounding the playback device. Such a frequency response may be determined based on the emitted first audio signal and detected second audio signal. In particular, the first audio signal (i.e. the stimulus) may excite the system. The detected second audio signal then represents the response of the system in the time domain. The playback device may then determine the frequency response by transforming the time domain response to the frequency domain, such as by determining a Laplace transform on the second audio signal, or the portion thereof that is a reflection of the first audio signal. In some embodiments, determining the Laplace transform may involve determining, by the processor 202, a fast Fourier transform (FFT), such as when the second audio signal is represented as discrete data points. While the FFT is provided by way of example, alternative transformations, such as a Hilbert transform, may be determined as well.

The determined frequency response of the system may indicate aspects of the environment. For instance, the processor 202 may determine that the bass frequencies within the frequency response are attenuated relative to the mid and/or treble frequencies, which may indicate that the playback device is outdoors. As another example, the processor 202 may determine that the frequency response has one or more resonant frequencies (which may be caused by the room or objects therein), which may be indicated by one or more peaks and/or one or more valleys. In addition, the number of peaks and valleys may indicate a degree of irregularity of the environment (i.e. a number of objects within the environment and/or an irregularity of the arrangement of the walls).

Within examples, one of the one or more reflection characteristics may relate to a variance between the frequency

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response of the system and an “ideal” frequency response of the playback device. For instance, the reflection characteristic may be a difference between the “ideal” frequency response and the frequency response of the system. In some embodiments, the reflection characteristic may be a difference between the ideal frequency response and the current frequency response at a particular frequency range, such as bass, mid, or treble frequencies.

Determining the difference between the “ideal” frequency response and the current frequency response may involve, for each frequency response, integrating the respective frequency response over frequency for a portion of the frequency range. For instance, the processor 202 may integrate each frequency response over bass frequencies (e.g. 16 to 512 Hz). The processor 202 may then determine a difference between the integrated frequencies.

The “ideal” frequency response may be a frequency response of the playback device in a particular configuration. Further, the ideal frequency response may not be truly ideal, but rather an approximation of a playback device that is operating as designed. For instance, the “ideal” frequency response may be a frequency response of the playback device as determined in open space. Alternatively, the “ideal” frequency response may be a frequency response determined in an anechoic chamber. Further, the “ideal” frequency response of the playback device may be an approximation of a factory configured frequency response. For instance, the “ideal” frequency response may be a typical or average frequency response of playback devices of a particular type produced by a manufacturer.

In another embodiment, the playback device may determine the “ideal” frequency response as an aspect of a set-up procedure. For example, during the set-up procedure, a user of the playback device may be instructed to place the playback device in a particular arrangement so that the playback device may determine a frequency response. The particular arrangement may be, for instance, in the center of a room, among other examples.

FIG. 7 shows an illustrative plot of a frequency response of a playback device in a small room. Frequency response 702 shows the frequency response without an adjusted equalization setting. In a small room, the frequency response tends to have more peaks and valleys at bass frequencies, as shown, because bass frequencies may resonate more in a smaller room. Frequency response 704 shows the frequency response after an equalization setting for the small room has been applied. Compared to frequency response 702, the peaks and valleys are attenuated in frequency response 704, as shown.

One or more of the reflection characteristics may relate to an impulse response. For instance, an impulse response may indicate one or more reflections of the first audio signal. The impulse response may also indicate characteristics of the reflections, such as an amount of time elapsed between two reflections.

FIGS. 8A-8C show example impulse responses of a playback device. FIG. 8A shows an example impulse response of a playback device in (relatively) open space. After the initial excitation, the impulse response does not show a reflection, which may indicate that the playback device is outdoors, for example. FIG. 8B shows another example impulse response of a playback device that is near a wall. As shown in FIG. 8B, this impulse response includes a reflection of the impulse (near 8.6 ms), which may indicate the presence of a wall. FIG. 8C shows yet another example impulse response of a playback device. As shown in FIG. 8C, the impulse response includes two similar reflections of the impulse (near 8.6 ms

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and 12 ms). Such similarity may indicate that the two similar reflections are each off of the same wall.

As noted above, in some examples, the first media playback may detect a plurality of audio signals including audio signals emitted by the first media playback and/or audio signals emitted by other playback devices within the media playback system. In some embodiments, the playback device may determine one or more reflection characteristics for each of the detected audio signals (or a portion thereof). Alternatively, a reflection characteristic may be based on two or more audio signals in the plurality of detected audio signals. Other examples are possible as well.

Referring back to the example media playback system that include the first playback device and the second playback device, after detecting the fourth audio signal, the first playback device may then determine one or more reflection characteristics based on the fourth audio signal. Determining the one or more reflection characteristics based on the fourth audio signal may involve, for instance, any of the techniques described above for determining one or more reflection characteristics based on the second audio signal as discussed above.

While characteristics of detected audio signals have been referred to herein as reflection characteristics, in some embodiments, the audio signals may be detected before a reflection occurs. For instance, as noted above, an audio signal may propagate directly, such as from a first playback device to a second playback device.

d. Adjusting an Equalization Setting of the Playback Device Based on the One or More Reflection Characteristics.

At block 508, the playback device adjusts an equalization setting of the playback device based on the one or more reflection characteristics. For instance, one or more of the audio processing components 208 may be configured to alter the frequency response of the playback device. Specifically, the one or more audio components 208 may include one or more filters. When audio content passes through the one or more filters, the amplitude of certain frequencies (or frequency ranges) may be increased. The amplitude of other frequencies (or frequency ranges) may be decreased. Alternatively, the processor 202 may be configured to alter the frequency response of the playback device. The processor 202 may, for example, apply digital signal processing, such as a digital filter, to audio content.

As noted above, one of the one or more reflections characteristics may indicate a frequency or frequency range. The playback device may adjust an equalization setting based on the frequency or frequency range. For instance, if the reflection characteristic indicates bass frequencies are attenuated, the equalization setting may boost bass frequencies (as noted above, 16-512 Hz). Alternatively, if a particular frequency, such as (2 kHz) is a peak or a valley, the equalization may responsively attenuate or boost that frequency.

Adjusting the equalization setting may involve disabling a speaker of the playback device. For instance, the processor 202 may disable the a speaker 212 when the one or more reflection characteristics indicate that the listening experience may be improved by disabling the speaker. For example, an object in close proximity to the front of the speaker may cause distortion, such as muffling, of audio outputted by the speaker. Due to the distortion, the listening experience may be improved by disabling the speaker. In such a circumstance, one or more particular reflection characteristics may indicate that the first audio signal reflected off a close object, such as an object within 10 centimeters of the playback device. Alternatively, the one or more particular reflection characteristics

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may indicate that the frequency response of the playback device is distorted by the object.

Within examples, adjusting the equalization setting may involve selecting a particular equalization preset from a plurality of equalization presets based on at least one of the one or more reflection characteristics. Some of the equalization presets may be pre-determined. For example, each of the plurality of equalization presets may be a respective bass gain setting. For instance, a “small room” equalization preset may be pre-determined to attenuate bass frequencies. As another example, an “outdoors” equalization preset may be pre-determined to boost bass frequencies. The playback device may then adjust the equalization setting according to the selected particular equalization preset.

e. Causing an Audio Track to Play According to the Adjusted Equalization Setting.

In some embodiments, the playback device may perform block 510. At block 510, the playback device may cause an audio track to play according to the adjusted equalization setting. For instance, the playback device may provide the audio track to the audio processing components 208, which may be adjusted based on the equalization setting. The audio processing components 208 may alter frequency components of the audio track according to the equalization setting. The audio amplifier 210 may then amplify the signal which may cause the speaker(s) 212 to emit the audio track.

f. Sending to a Second Media Playback Device an Indication of the Reflection Characteristic

In some embodiments, the playback device may perform block 512. At block 512, the playback device may send to a second media playback device an indication of the reflection characteristic.

Playback devices of the media playback system may share their one or more respective reflection characteristics with the other playback devices in the media playback system. In some configurations, a particular playback device may share its one or more reflection characteristics with all of the playback devices in the media playback system. In other configurations, the particular playback device may share with a subset of playback devices. For example, the particular playback device may be grouped into a zone with three other playback devices, and the particular playback device may share its one or more reflection characteristics with the three other playback devices in its zone.

For instance, referring to FIG. 1, playback device 104 may send a particular reflection characteristic to playback devices 106, 108, and 110 that are grouped with playback device 104 into a zone. In turn, each of playback devices 106, 108, and 110 may receive the particular reflection characteristic. Playback devices 106, 108, and 110 may then send a respective particular reflection characteristic to playback device 104 and to each of the other playback devices in the zone. Each of the playback devices may send and/or receive reflection characteristics via a respective network interface, such as network interface 214 in FIG. 2.

In some circumstances, the playback device may adjust the equalization setting based on determined reflection characteristics from other playback devices within the media playback system. For instance, a particular playback device may adjust its equalization setting based on reflection characteristics from other playback devices grouped with the particular playback device in a zone. Basing the equalization setting on reflection characteristics from other playback devices may result in an equalization setting that is more appropriate for the environment.

For example, FIG. 6 shows an example configuration of a media playback system 100 that includes playback devices

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602 and 604 that are grouped into a zone. Playback devices 602 and 604 may each emit a respective first audio signal, detect a respective second audio signal, and then determine a respective reflection characteristic that indicates the size of the room. Further, playback devices 602 and 604 may exchange respective reflection characteristics by sending and receiving the reflection characteristics over respective network interfaces.

The reflection characteristic determined by playback device 602 may indicate a smaller room than the reflection characteristic determined by playback device 604 because of the relative difference in how far the each emitted first audio signal travels before coming into contact with a respective wall that reflects the first audio signal, as shown. If playback devices 602 and 604 each base their respective equalization setting on their own respective reflection characteristic, then playback device 602 may adjust the equalization to a setting that is appropriate for a small room, while playback device 604 may adjust the equalization to a setting that is appropriate for a large room. In some circumstances, this difference in relative configurations may result in a mismatch in the frequency responses between playback device 602 and 604, which may worsen the listening experience for some users (yet, in other circumstances, this difference may be minor and may not have a significant impact on the listening experiences of users). However, as noted above, playback devices 602 and 604 may adjust the equalization setting based on determined reflection characteristics from one another. For instance, playback devices 602 and 604 may each average their determined reflection characteristic with the determined reflection characteristic of the other playback device. In this manner, the resulting adjusted equalization setting for each of playback devices 602 and 604 may be somewhere between that of a large room and a small room.

Within examples, each playback device of a media playback system may share its adjusted equalization setting with the other playback devices in the media playback system, such as by sending the adjusted equalization setting to other playback devices in the media playback system. In turn, one or more of the other playback devices may adjust their equalization setting based on the received equalization settings.

For instance, a first playback device and a second playback device that are grouped into a zone may each send to one another their respective adjusted equalization setting. Then, each of the first and second playback devices may adjust their respective equalization setting based on the received equalization setting. For example, the first playback device may determine that a particular one of the two adjusted equalization settings from either the first playback device or the second playback device is preferable for the environment. The first playback device may then (i) adjust its equalization setting based on the particular one of the two adjusted equalization settings and/or (ii) instruct the second playback device to adjust its equalization setting based on the particular one of the two adjusted equalization settings.

IV. Conclusion

The description above discloses, among other things, various example systems, methods, apparatus, and articles of manufacture including, among other components, firmware and/or software executed on hardware. It is understood that such examples are merely illustrative and should not be considered as limiting. For example, it is contemplated that any or all of the firmware, hardware, and/or software aspects or components can be embodied exclusively in hardware, exclusively in software, exclusively in firmware, or in any combi-

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nation of hardware, software, and/or firmware. Accordingly, the examples provided are not the only way(s) to implement such systems, methods, apparatus, and/or articles of manufacture.

As indicated above, the present application involves dynamically adjusting the equalization of a playback device based on the environment in which the playback device is operating. In one aspect, a method is provided. The method involves emitting, by a playback device, a first audio signal, detecting, by the playback device, a second audio signal, wherein at least a portion of the second audio signal is a reflection of the first audio signal, in response to the detecting, determining one or more reflection characteristics, wherein each of the one or more reflection characteristics are based on at least the second audio signal, adjusting an equalization setting of the playback device based on the one or more reflection characteristics; and causing an audio track to play according to the adjusted equalization setting.

In another aspect, a second method is provided. The second method is operable in a media playback system comprising a plurality of playback devices, wherein each playback device comprises a respective microphone and a respective speaker. The second method involves receiving an indication of a first audio signal, detecting, by a microphone of the first playback device, a second audio signal, wherein at least a portion of the second audio signal is indicative of the first audio signal, in response to the detecting, determining a first reflection characteristic based on the second audio signal, adjusting an equalization setting of the first playback device based on at least the first reflection characteristic, and sending to a second media playback device an indication of the first reflection characteristic.

In another aspect, a device is provided. The device includes a speaker, a microphone that is physically coupled to the speaker, a processor, a network interface, a data storage, and a program logic stored in the data storage. The program logic is executable by the processor to emit a first audio signal from the speaker, detect, via the microphone, a second audio signal, wherein at least a portion of the second audio signal is a reflection of the first audio signal, in response to the detecting, determine a first reflection characteristic based on at least the second audio signal, adjust an equalization setting of the playback device based on at least the first reflection characteristic, and play, via the speaker, an audio track according to the equalization setting.

In yet another aspect, a non-transitory computer readable memory is provided. The non-transitory computer readable memory has stored thereon instructions executable by a computing device to cause the computing device to perform functions. The functions include emitting, by a playback device, a first audio signal, detecting, by the playback device, a second audio signal, wherein at least a portion of the second audio signal is a reflection of the first audio signal, in response to the detecting, determining one or more reflection characteristics, wherein each of the one or more reflection characteristics are based on at least the second audio signal, adjusting an equalization setting of the playback device based on the one or more reflection characteristics; and causing an audio track to play according to the adjusted equalization setting.

Additionally, references herein to “embodiment” means that a particular feature, structure, or characteristic described in connection with the embodiment can be included in at least one example embodiment of an invention. The appearances of this phrase in various places in the specification are not necessarily all referring to the same embodiment, nor are separate or alternative embodiments mutually exclusive of other embodiments. As such, the embodiments described

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herein, explicitly and implicitly understood by one skilled in the art, can be combined with other embodiments.

The specification is presented largely in terms of illustrative environments, systems, procedures, steps, logic blocks, processing, and other symbolic representations that directly or indirectly resemble the operations of data processing devices coupled to networks. These process descriptions and representations are typically used by those skilled in the art to most effectively convey the substance of their work to others skilled in the art. Numerous specific details are set forth to provide a thorough understanding of the present disclosure. However, it is understood to those skilled in the art that certain embodiments of the present disclosure can be practiced without certain, specific details. In other instances, well known methods, procedures, components, and circuitry have not been described in detail to avoid unnecessarily obscuring aspects of the embodiments. Accordingly, the scope of the present disclosure is defined by the appended claims rather than the forgoing description of embodiments.

When any of the appended claims are read to cover a purely software and/or firmware implementation, at least one of the elements in at least one example is hereby expressly defined to include a tangible, non-transitory medium such as a memory, DVD, CD, Blu-ray, and so on, storing the software and/or firmware.

I claim:

1. A method comprising:

emitting, by a playback device, a first audio signal;
detecting, by the playback device, a second audio signal,
wherein at least a portion of the second audio signal is a reflection of the first audio signal;
in response to the detecting, determining one or more reflection characteristics, wherein each of the one or more reflection characteristics are based on at least the second audio signal;
adjusting an equalization setting of the playback device based on the one or more reflection characteristics; and
causing an audio track to play according to the adjusted equalization setting.

2. The method of claim 1, wherein the playback device comprises a microphone and a speaker, and wherein the microphone is physically coupled to the speaker.

3. The method of claim 1, wherein the first audio signal has a first waveform, wherein the second audio signal has a second waveform, and wherein detecting the second audio signal comprises:

determining, based on the first waveform and the second waveform, that the portion of the second audio signal is the reflection of the first audio signal.

4. The method of claim 1, wherein adjusting the equalization setting of the playback device based on the one or more reflection characteristics comprises

disabling a speaker of the playback device.

5. The method of claim 1, wherein at least one of the one or more reflection characteristics comprises an amount of time elapsed from emitting the first audio signal and detecting the second audio signal.

6. The method of claim 1, wherein the first audio signal is emitted at a first sound pressure level, wherein the second audio signal is detected at a second sound pressure level, and wherein at least one of the one or more reflection characteristics comprises a difference between the first sound pressure level and the second sound pressure level.

7. The method of claim 1, wherein adjusting an equalization setting of the playback device based on the one or more reflection characteristics comprises:

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selecting a particular equalization preset from a plurality of equalization presets based on at least one of the one or more reflection characteristics; and

adjusting the equalization setting of the playback device according to the selected particular equalization preset.

8. The method of claim 7, wherein each of the plurality of equalization presets comprises a respective bass gain setting.

9. The method of claim 7, wherein at least one of the one or more reflection characteristics comprises an amount of time elapsed since emitting the first audio signal until detecting the second audio signal, wherein each of the plurality of equalization presets is matched to a respective time range, and wherein selecting one from a plurality of equalization presets based on the at least one reflection characteristic comprises:

determining a particular time range that corresponds to the amount of time; and

selecting the equalization preset matched to the determined particular time range.

10. The method of claim 1, wherein the first audio signal is an impulse signal.

11. In a media playback system comprising a plurality of playback devices, wherein each playback device comprises a respective microphone and a respective speaker, a method comprising:

receiving an indication of a first audio signal;

detecting, by a microphone of the first playback device, a second audio signal, wherein at least a portion of the second audio signal is indicative of the first audio signal; in response to the detecting, determining a first reflection characteristic based on the second audio signal;

adjusting an equalization setting of the first playback device based on at least the first reflection characteristic; and

sending to a second playback device an indication of the first reflection characteristic.

12. The method of claim 11, wherein adjusting the equalization setting is further based on at least a second reflection characteristic, the method further comprising:

receiving, via a network interface of the playback device, an indication of the second reflection characteristic from the second playback device.

13. The method of claim 11, wherein the equalization setting is further based on at least a second reflection characteristic, the method further comprising:

detecting, via a microphone of the first playback device, a fourth audio signal, wherein at least a portion of the fourth audio signal is a reflection of a third audio signal emitted by the second playback device; and determining the second reflection characteristic based on the fourth audio signal.

14. The method of claim 11, further comprising: sending an indication of the adjusted equalization setting to the second media playback device.

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15. A playback device, comprising:

a speaker;

a microphone that is physically coupled to the speaker;

a processor;

a network interface;

a data storage; and

a program logic stored in the data storage and executable by the processor to:

emit a first audio signal from the speaker;

detect, via the microphone, a second audio signal, wherein at least a portion of the second audio signal is a reflection of the first audio signal;

in response to the detecting, determine a first reflection characteristic based on at least the second audio signal;

adjust an equalization setting of the playback device based on at least the first reflection characteristic; and play, via the speaker, an audio track according to the equalization setting.

16. The playback device of claim 15, wherein the equalization setting is further based on at least a second reflection characteristic, and wherein the program logic is further executable by the processor to:

receive, via the network interface, an indication of the second reflection characteristic from a second playback device.

17. The playback device of claim 15, wherein the equalization setting is further based on at least a second reflection characteristic, and wherein the program logic is further executable by the processor to:

detect, by the microphone, a fourth audio signal, wherein at least a portion of the fourth audio signal is indicative of a reflection of a third audio signal emitted by a second playback device; and

determine the second reflection characteristic based on the fourth audio signal.

18. The playback device of claim 15, wherein detecting the second audio signal comprises:

determining that the portion of the second audio signal is a reflection of the first audio signal.

19. The playback device of claim 15, wherein the first reflection characteristic comprises an amount of time elapsed from emitting the first audio signal to detecting the second audio signal.

20. The playback device of claim 15, wherein adjusting an equalization setting of the playback device based on at least the first reflection characteristic comprises:

selecting a particular equalization preset from a plurality of equalization presets based on the first reflection characteristic; and

adjusting the equalization setting of the playback device according to the selected particular equalization preset.

* * * * *

Exhibit B

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POWERFUL AUDIO CAPABILITIES

Google Nest speakers are one step closer to replacing your Sonos system

All those free Nest Minis are coming in handy.

MICHAEL ALLISON 18 Aug 2020



Source: Android Central

What you need to know

- **Google is making it more convenient to own multiple Nest speakers.**
- **A new update rolling out today will offer more powerful multi-room audio.**
- **Nest Hubs and other Google Assistant smart-displays will get the new multi-room control today, while the Google Home app will get it in a fall update.**

Google is updating Nest smart home devices with more powerful and dynamic multi-room support. Previously, users could pair [Nest devices for stereo audio](#) or manually create a multi-room speaker home grouping. Going forward, it'll be able to be done dynamically. If you have a Google Assistant-powered smart display like the Nest Hub, you'll be able to tap the icon at the bottom of the screen to open up the multi-room control interface and add/remove devices as you move through your home.



▶ **Verizon is offering the Pixel 4a for just \$10/mo on new Unlimited lines**

Here's how [Google suggests users](#) can use the new capabilities:

“ **Move music from one room to another:** Stream transfer lets you easily move music, videos, podcasts, and more between compatible devices in your home using your voice, the Google Home app, or the touchscreen on your Nest smart display.

Experience stereo sound: Stereo pair two Nest Mini or Google Home Max devices in the Google Home app for room-filling sound and even more immersive left and right channel separation.

Get new music recommendations: YouTube Music and Spotify Premium subscribers can ask, "Hey Google, recommend some music" and Google Assistant will offer multiple choices from artists and genres that they like, and others like them to choose from.

The new multi-room interface will roll out to Google Nest Hub devices today as well as other Assistant-enabled smart displays. An update to the Google Home app in the fall will let Android phones, tablets, and Play Store-compatible Chromebooks control them.



Google Nest Hub Max

The Nest Hub Max remains one of Google's nicest smart home devices. With a nice roomy display and great sound, it's a decent addition to your living room.

\$229 at Best Buy

\$229 at Walmart

We may earn a commission for purchases using our links. [Learn more.](#)

From the Editor's Desk

Google's giving up too much ground in the smart home fight

We're in the thick of our fall launches, but after the tidal wave of new products from Amazon last week, Google's Launch Night In looks like it'll barely make a splash. That's not good, because Alexa and Ring are rapidly gaining on Assistant and Nest.

Au clair de la lune

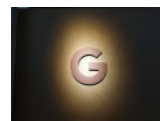
Luna is both a safe bet and Amazon's best idea in years

Is "rolling your own" Netflix-style game library what we really want? Amazon thinks so.

Now we're getting somewhere

Google's parent company settles shareholder lawsuit over sexual misconduct

Following sexual misconduct reports from 2018, Google has settled a shareholder lawsuit and announced major changes to how the company operates in these regards — including no severance packages for employees



Keep the big, beautiful OnePlus 8 Pro big and beautiful with a case

The OnePlus 8 Pro is a big, glass-backed phone, and big glass-backed phones get cases. These are the best options for protecting your new flagship in style.



 [News](#) [Google Nest Hub](#)

Google Nest speakers are one step closer to replacing your Sonos system

 Log in or  Register to Comment

fuzzylumpkin

I hardly think so.

Tue Aug 18, 2020 3:28pm

 Reply

pgg101

Sonos has been dead for a few years now in my house. I unplugged my Sonos shortly after I started getting Google Home speakers throughout my house.

Tue Aug 18, 2020 3:46pm

 Reply

rob damiani

I am sorry for your loss

Tue Aug 18, 2020 3:59pm

 Reply

real0395

I think Sonos is very overpriced, but are the Google speakers better quality than the Sonos?

Tue Aug 18, 2020 7:29pm

 Reply

medianemesis

Seeing as Google Nest speakers do not have the audio quality of the Sonos speakers (except maybe the Max), they have nothing close to the integration with roughly 70+ music services like Sonos has, and the Google Home app is nowhere as fluid as the S2 app regarding media playback/controls on multiple devices simultaneously, I daresay Google has a long way to go.

Even YouTube and podcasts streams cast to the Google Home still drop out and sometimes resume on the phone, so no...

Tue Aug 18, 2020 3:59pm

 Reply

Lone Wolf2

Yeah, right. For all those lovers of transistor radio quality sound, great news.

Wed Aug 19, 2020 10:49am

 Reply

RSage67

There are a few of us who will never buy into Google/Nest.

Wed Aug 19, 2020 3:00pm

 Reply

Only A Few People Know These Airplane Hacks
amomedia.com

One Thing All Liars Have In Common (Brace Yourself)
TruthFinder

If You Like to Play, this Strategy Game is a Must-Have. No Install.
Forge Of Empires

Look Closer, The Photographer Was Not Expecting This Photo
Scientific Mirror

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Exhibit C

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Selfish protests on brink of extinction, says NICK FERRARI

Google Home upgrade brings some of the best Sonos features to your speakers

GOOGLE HOME owners will now be able to use some of the greatest features from connected audio specialists Sonos on their voice-activated gadgets.

By AARON BROWN

PUBLISHED: 07:12, Sun, Aug 23, 2020 | UPDATED: 07:12, Sun, Aug 23, 2020

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Google Home users can now quickly add or remove speakers to blast their favourite tracks (Image: GOOGLE - UNISPLASH)



Google has started to roll out a number of new multi-room audio options for Google Nest speakers and smart displays controlled within the Google Home app. The new functionality appears to be the most direct challenge to the likes of Sonos, which has enjoyed enormous success by creating a series of connected speakers and soundbars that can play music simultaneously – or individually.

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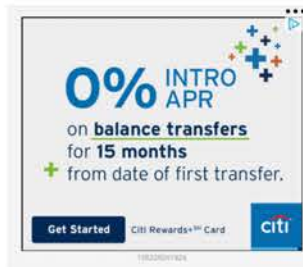


Google warns free services like Gmail and YouTube are now 'at risk'



Google Maps gets its most impressive update yet ...but there's a catch

In a blog post shared earlier this week, Google revealed its new dynamic speaker group options, which lets you add and remove speakers from the Google Home app with a few taps. Although you've been able to manually group together Google Assistant-enabled speakers, smart displays and Chromecasts for a while now, Google didn't offer the ability to quickly throw together a few devices on a whim.



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The upgraded multi-room control works inside a number of your favourite music apps, like Spotify, Apple Music, YouTube Music, and more. If the app already supports the ability to Cast your audio to a Google Assistant-enabled speaker or a Chromecast, then you'll be able to bundle a few speakers together to create a haphazard grouping. Tapping on the Cast icon in the corner of the screen when any audio content is playing will let you add or remove your other devices throughout your home.

If you have a Google Nest Hub, or another smart display, in your home, you don't even need to pull out your smartphone. Instead you'll be able to use a new interface included in the clever gadget to quickly tick or untick speakers on your network. Just like Sonos, you can also change the volume on each speaker individually from the main interface.

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As pictured above, the new interface lets you toggle speakers, Chromecasts, and smart displays
(Image: GOOGLE)



Of course, if you find yourself adding the same speakers again and again, it might be worth putting in the time to create a dedicated group. That allows you to beam audio from these speakers with a single tap – or ask Google Assistant to do it for you.

Chris Chan, Product Manager for Google Nest, says coupling the new feature with stereo pairing for two Nest Mini or Home Max devices will bring left and right channel support and room-filling audio for your favourite track.

TRENDING



Your next Virgin Media bill could be a shock, but not in the way you might expect



WhatsApp will soon let you do something it's never allowed before



Microsoft has removed security features from your Windows 10 PC, but there's a good reason

The latest upgrade to Google Home audio gadgets comes after the Mountain View-based company introduced a new feature, dubbed Stream Transfer, that lets you move music, videos, podcasts and more between compatible devices in your home using your voice, the Google Home app or the touchscreen on your Nest smart display. So, you can be listening to a podcast in the kitchen while preparing dinner – and throw the episode to the speaker in your dining room to continue listening while you munch.

As Google Home becomes a more fully-fledged multi-room audio app, Sonos recently overhauled its entire app. The next-generation Sonos app includes support for high resolution



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audio including Dolby Atmos, as well as delivering new security updates. With the arrival of the new app, Sonos had to drop support for a number of connected speakers.

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New Google Nest release date, price, and rumors

By [Olivia Tambini](#) 21 September 2020

The next Google Nest speaker has been revealed



(Image credit: Google)

Nearly four years after the Google Home was launched, the tech giant has just confirmed a [new version of its first Google Assistant smart speaker](#), the so-called Google Nest Audio.

After the new Google speaker was leaked by Android TV Guide on [Twitter](#), the company responded by sharing a photo of the Google Nest Audio, alongside a [video](#) via [9to5Mac](#) of the [smart speaker](#) in action:

We initially heard that the new Google Nest speaker would hit shelves in late August, as reputable leaker Roland Quandt alleged in a [tweet](#).

According to Quandt, Google's latest [smart speaker](#) would be available from "the end of August", and will cost 100€ – that works out at around \$120 / £90 / AU\$160. That's a little pricier than the original [Google Home](#), which cost (\$89 / £89 / AU\$128) at launch.

Cut to the chase

What is it? A new Google Assistant smart speaker.

When will it be released? We think on September 30 at the next Google event.


How much will it cost? It's rumored it will cost around \$120 / £90 / AU\$160.

Despite the slight delay, it looks like the Nest smart speaker will actually launch on September 30, alongside the [Pixel 5](#) and a [new Chromecast](#). We've been invited to join Google for its '#LaunchNightIn' on Wednesday, September 30, with the event kicking off at 11am PT / 2pm ET / 7pm BST (that's 4am, October 1 in Australia).

The invite reads: "We invite you to learn all about our new [Chromecast](#), our latest smart speaker and our new Pixel phones."

Previously, the new Google speaker was apparently revealed to [9to5Google](#) by 'sources familiar to the matter', and it's poised to sit somewhere in between the [Google Home](#) and [Google Home Max](#), the brand's largest and best-sounding wireless speaker.

According to that source, the Google Nest Audio has been going by the codename Prince at Google HQ – like the musician – suggesting that it could have a stronger focus on audio quality than its predecessor. That means it could be a new rival for the likes of the [Sonos One](#), the [best smart speaker](#) you can buy in 2020.

Get your popcorn ready for #LaunchNightIn. Click below to know when to tune in.  pic.twitter.com/RpKOinCDHj [September 14, 2020](#)

What will the new Google Nest speaker be called?

What the new speaker will be called officially remains a mystery – though a recent leak by [WinFuture](#) suggests that it will be known as the Google Nest Audio.

A few years ago, Google placed the vast majority of its smart devices under the Google Nest umbrella, implying that the products were all interconnected and compatible with the Nest series of [smart thermostats](#), alarms, and [security cameras](#).

While we've seen a few Google speakers that fall under this umbrella, including the Google Nest Hub, [Google Nest Mini](#), and [Google Nest Hub Max](#), the original Google Home and Google Home Max were never renamed.

Hopefully we'll find out for sure on September 30, but in the meantime, here's everything we know about the rumored Google Nest Audio, as well as all the features we'd like to see from a new Google speaker.

New Google Nest release date

Now that Google has unveiled the Google Nest Audio via a video and an image, a release date for the new smart speaker is imminent; and an invitation to the next Google event suggests that it will launch on September 30.

We initially thought the new Google speaker would arrive sooner, as reputable leaker Roland Quandt alleged in a [tweet](#), saying that the smart speaker would hit shelves at "the end of August", coming in two colors, Chalk and Charcoal.

Whether the September 30 release date is a result of delays is unclear, but it makes sense that Google would show off its latest smart speaker alongside the Pixel 5 and a new Chromecast model.

The launch will be live streamed on Wednesday, September 30, with the event kicking off at 11am PT / 2pm ET / 7pm BST (that's 4am, October 1 in Australia). We'll be there to live blog all the news as it comes in, so make sure you check back in for the latest from Google.

[What is Google Assistant?](#)

New Google Nest price

We initially thought that the Google Nest Audio would probably be priced similarly to the original Google Home, which cost (\$89 / £89 / AU\$128) at launch.

However, Roland Quandt has claimed that the new speaker will cost 100€ – that works out at around \$120 / £90 / AU\$160. That's a little pricier than the original [Google Home](#), though it's still relatively cheap for a smart speaker.

That would corroborate previous claims that it will be priced somewhere between the Google Home and the Google Home Max, which was fairly expensive at \$399 / £399 / AU\$549.

If you can't wait for the new Google speaker, check out the best Google Nest deals we've found today:

New Google Nest design

Google has now officially lifted the veil on its new and improved Nest smart speaker by releasing the image seen at the top of this article.

It will apparently be available "in Charcoal and Chalk as usual", in keeping with previous Google Assistant speakers like the [Google Nest Hub Max](#) and the [Google Home Max](#).

As you can see from that photo, the redesigned Nest speaker has adopted the mesh fabric styling of the Google Nest Mini. The device, which stands upright, once again features hidden LED lights under the aforementioned fabric.

The image was released after photos of the new speaker were leaked by [Android TV Guide](#):

Recently certified by the FCC, here is our first look at GXCA6, the new @Google Nest Speaker, replacing the original Google Home. 🗨️
pic.twitter.com/Ltp1quPFqc[July 9, 2020](#)

In keeping with the Nest Mini, the new Nest appears to retain the smaller device's mic mute switch, which should provide comfort to those who value their privacy.

We can also see that Google has opted to place a hole on the unit where users will be able to plug in the device's power adapter (also pictured).

We can't imagine that Google would choose to make the hole so blatantly visible on the top of the device, and combined with the rubberized portion of the speaker in the tweet's second image, we have to assume the device will stand upright.

That upright design has been backed up by further [images of the Google Nest Audio that have recently emerged](#), thanks to a leak by WinFuture.

According to WinFuture, as well as Charcoal and Chalk, the new speaker will be available in Sage, Sand and Sky colors – though they might not all be available in all of the different markets that the Nest Audio launches in.

The speaker is expected to stand around 7 inches or 18 cm high, and will have a notification light on the front to represent volume levels and to tell you when the Google Assistant is waiting for your input.

New Google Nest specs

It sounds as though the Google Nest Home will represent a happy medium between the Google Home and the Google Home Max in terms of sound, design, and price.

According to the 9to5Google report, the new smart speaker will use Google Assistant like its predecessors, and it won't be a smart display with a screen like the Nest Hub and Nest Hub Max.

That voice-only control makes sense if the Google Nest Home is set to replace the original Google Home or Google Home Max speakers.

The new Google speaker will apparently sport larger drivers than the first Google Home, which should give it a more powerful sound and a better bass response – however, the source suggested that it won't be quite as sonically powerful as the Google Home Max, which boasts two woofers and two tweeters.

Looks-wise, it's set to be kitted out with the same mesh fabric design we've seen with the Google Nest Mini – and it could possibly come in a range of colors, like the diminutive speaker.

The TechRadar logo is displayed in a white, lowercase, sans-serif font against a light gray rectangular background.

The Google Nest Mini (pictured) sports a sleek fabric casing. (Image credit: Google)

New Google Nest speaker: what we want to see

When the original Google Home launched in 2016, we were really impressed – but a lot has changed in the world of smart speakers in the last four years, and Google itself has released superior models in that time.

So, we know that Google – and its biggest competitors, including Sonos, Amazon, and Apple – is capable of great things when it comes to building smart speakers. With that in mind, here are some of the things we want to see from the Google Home 2.

Better sound

While the original Google Home didn't sound bad per se, it didn't exactly blow us away with its audio prowess. Compared to the likes of the Sonos One – which is admittedly, more expensive – it lacks robustness in the low end and clarity in the mid and high frequencies.

If the Google Nest Home can take a few cues from its more musically-inclined sibling, the Google Home Max, the company could be onto a real winner, combining audio fidelity with a conveniently compact build and a (hopefully) budget-friendly price.

An AUX port

The audio drivers in the Google Home aren't anything to shout about, and more sound-focused buyers should probably be angling for the Google Home Max, anyway. But it's a shame such a vast range of artists are being funneled through inferior speakers.

Google Assistant has managed to cobble together the biggest music library of any smart assistant, thanks to Google Play Music as well as the Google-owned [YouTube Music](#) – if you sign up for the service, at least. The current model can already connect to external amps and speakers over Bluetooth, but getting a physical AUX port would do a lot to win over listeners concerned about losing audio quality over the air.

More microphones

The ability of a smart speaker to detect your voice accurately is crucial to its success, and Google didn't exactly push out the boat with the original Home speaker.

[According to a teardown by iFixit](#), the Google Home has just two microphones compared to the [Amazon Echo's](#) seven-microphone array, which is designed to pick up your voice from every angle.

The Echo's substantial microphone array was cited as a reason for its ability to pick up your voice in noisy environments – and if Google wants to beat its biggest competitors, it'll need to make sure its microphone array is watertight.

Portability

Right now, no Google Home or Google Nest speakers are portable, but we'd love to see a model that can double up as a Bluetooth speaker like the [Sonos Move](#) – especially if it retains the compact design of the original Google Home.

If the Google Home 2 is portable, it would be great to see an IPX4 waterproof rating too; after all, you'd want to be able to take it into your garden on a sunny day.

Competitive pricing

Isn't this what we always want? The Google Home retailed at £129 / \$129 / AU\$199 at launch, so we imagine the new model would seem a good deal by bringing in upgraded features for the same price. However, getting an enhanced model that matched more closely to the Amazon Echo's £89 / \$99 / AU\$119, would do a lot to lower the price barrier for new adopters.

[Amazon Echo vs Google Home: which smart speakers are best?](#)
[Apple HomePod 2 release date, news, and rumors](#)

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Exhibit E

GOOGLE NEST

House music: New multi-room audio control from Nest

**Chris Chan**

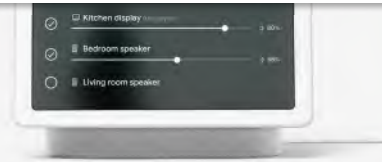
Product Manager, Google Nest

Published Aug 18, 2020



As a new parent, my Nest home audio system has become a go-to, whether it's to keep my daughter entertained during bathtime with some music...or keep myself entertained with a podcast while I'm making a bottle at 3 a.m. Controlling the audio throughout my home, no matter who's listening, has been incredibly helpful.

Today, we're expanding that control. You can already [manually group Nest devices](#) in order to play the same music on various speakers at the same time, and now we're launching multi-room control so you can dynamically group multiple cast-enabled Nest devices (speakers, Smart Displays, Chromecasts) in real-time to fill multiple rooms with music. Multi-room control works with your favorite audio apps, including YouTube Music, Spotify, Pandora and more. If you have more than one Google Assistant-enabled smart speaker or Smart Display, tap the icon in the bottom left corner of the screen when any audio content is playing, and you'll easily be able to add or remove your other devices throughout your home.



This update helps Nest devices come together as a whole-home audio system. Here are a few other ways I take advantage of mine:

Move music from one room to another: [Stream transfer](#) lets you easily move music, videos, podcasts and more between compatible devices in your home using your voice, the Google Home app or the touchscreen on your Nest smart display.


Experience stereo sound: [Stereo pair](#) two Nest Mini or Google Home Max devices in the Google Home app for room-filling sound and even more immersive left and right channel separation.

Get new music recommendations: YouTube Music and Spotify Premium subscribers can ask, "Hey Google, recommend some music" and Google Assistant will offer multiple choices from artists and genres that they like, and others like them to choose from.

The multi-room control interface will start rolling out to all Nest Hub, Nest Hub Max and other compatible Assistant-enabled Smart Displays today, and the same functionality will be coming to the Google Home app later this fall.

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Exhibit F

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

SONOS, INC.,

Plaintiff,

v.

GOOGLE LLC,

Defendant.

§
§
§
§
§
§
§

C.A. 6:20-cv-881

JURY TRIAL DEMANDED

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Sonos, Inc. (“Sonos” or “Plaintiff”) hereby asserts claims for infringement of United States Patent Nos. 9,967,615; 10,779,033; 9,344,206; 10,469,966; and 9,219,460 (the “patents-in-suit”; attached hereto as Exhibits 1-5 respectively) against Defendant Google LLC (“Google” or “Defendant”), and alleges as follows:

INTRODUCTION

1. Sonos is an American success story. It was founded in 2002 in Santa Barbara, California by a handful of engineers and entrepreneurs with a vision to invent the world’s first wireless, whole-home audio system. At the time, popular audio systems were dependent on a centralized receiver hard-wired to each individual passive speaker throughout a home. Further, most homes with Internet access had dial-up connections, the iPhone was still five years away, and there were no streaming music services. The technological barriers confronting Sonos were enormous.

2. To deliver on its vision, the Sonos team completely reimagined the in-home music system as a decentralized network of smart playback devices, and it developed a platform that could seamlessly and wirelessly distribute audio room by room or throughout the home at the user’s discretion. Sonos created a “choose what to play, where to play it, and how loud” wireless audio system that could not only perform without lag (*e.g.* buffering, or network interruptions), but that was also so simple and intuitive that customers would make it part of their daily lives.

3. Commercial success did not come easy for Sonos as its vision was in many ways ahead of its time. But year by year, consumers – and the entire industry – came to appreciate that wireless multi-room audio devices and systems could not only work, but could become an essential part of the listening experience. Success required staying true to Sonos’s disruptive vision, continuing to innovate while adjacent industries caught up and customers became more and more enamored with the idea of Sonos as they had the chance to encounter and use its products. Once Sonos had taken all the risks and placed enormous bets on research and development, the “first followers” began to copy Sonos’s innovations.

4. To this day, Sonos remains focused on innovations that further enhance the listening experience. Sonos invests heavily in research and development and, as a result, frequently invents new systems with new technologies, enhanced functionality, improved sound quality, and an enriched user experience.

5. As a result, Sonos has become one of the world’s leading providers of innovative audio products. In recognition of its wide-ranging innovations, the U.S. Patent & Trademark Office has granted or allowed Sonos more than 940 U.S. patents, including the patents-in-suit, with hundreds more patents in other countries. The innovations captured by these patents cover many important aspects of wireless multi-room audio devices/systems, including, for example, how to manage and control groups of playback devices, how to facilitate seamless control and transfer of audio playback among devices, and how to output amazing sound quality.

6. The industry has recognized the importance of Sonos’s patents. For example, Sonos earned a spot on the IPO list of “Top 300 Organizations Granted U.S. Patents” and the IEEE recognized Sonos as having one of “[t]he technology world’s most valuable patent portfolios.” *See* Exs. 6 and 7.

7. Sonos launched its first commercial products in 2005 and has since released a wide variety of critically acclaimed, patented, wireless multi-room audio products, including, for example, the Play:1, Play:3, Play:5 (Gen 1 and Gen 2), One (Gen 1 and Gen 2), One SL, Move,

Playbar, Playbase, Beam, Sub, Connect, Port, Connect:Amp, Amp, Five, and Arc. *See, e.g.*, Ex. 8. Sonos’s products can be set up and controlled by the Sonos app. *Id.*

8. Sonos’s efforts have made it incredibly popular with its customers. Sonos estimates that in fiscal year 2019, Sonos’s customers listened to 7.7 billion hours of audio content using its products. And, as of September, 2019, almost two thirds of Sonos households had purchased and installed more than one Sonos product.

9. Sonos’s record of innovation has made it the undisputed leader in what has come to be called the “multiroom audio” field. *See, e.g.*, Ex. 9 (2018 Digital Trends: “Sonos is the king of multiroom audio....”); Ex. 10 (2019 What Hi-Fi: “[N]o multi-room offering is as complete or as pleasurable to live with as Sonos.”).

10. Sonos has already sued Google for infringing patents on its first group of inventions involving the set-up, control, playback, and synchronization of wireless playback devices. This case involves a second group of inventions which, as described more extensively below, tackle the novel technological challenges of how to stream music from a cloud-based service, how to create, manage, and invoke “zone scenes” to configure how multiple playback devices work together, and how to dynamically adjust the equalization of a playback device based on the environment in which the playback device is operating.

GOOGLE BEGINS INFRINGING

11. Almost a decade after Sonos created the smart-speaker market, Google entered the space. Initially, Google sought to work with Sonos and, through those efforts, gained access to Sonos’s engineers, products, and technology. All too quickly, however, Google shifted focus and began to develop and sell products that copied Sonos’s technology and infringed Sonos’s patents.

12. Part of what makes Sonos so successful is that, through its application, Sonos is compatible with many different third-party music streaming services. When Google publicly launched its own streaming music service – Google Play Music – in late 2011, Sonos worked with

Google to integrate the Google Play Music service into the Sonos ecosystem. As a result, Google Play Music launched on the Sonos platform in 2014. *See, e.g.*, Ex. 11.

13. This should have benefited everyone: Sonos’s customers gained access to another streaming service and Google Play Music users gained access to Sonos’s devices. But as the press recognized at the time, Sonos’s integration work with Google was especially “deep” and therefore gave Google a wide aperture through which to view Sonos’s proprietary technology. *Id.* (2014 Wired: “This is the first time this sort of deep integration has happened between a third party music service and Sonos.”). The copying soon followed.

14. Just eighteen months later, in 2015, Google began willfully infringing Sonos’s patents. On information and belief, Google used the knowledge it had gleaned from Sonos to build and launch its first wireless multi-room audio product – Chromecast Audio.

15. Google’s Chromecast Audio began what has turned into Google’s relentless effort to copy Sonos and use Sonos’s patented technology. For example, although Google’s original Chromecast Audio did not yet include Sonos’s patented multi-room audio functionality, even when it was launched Google was working to add that Sonos-patented feature. *See* Ex. 12 (2015 The Guardian: “Google is also working on multi-room audio streaming using the Chromecast Audio, but it will not support the popular feature out of the box.”). And, when Google added the infringing feature, the press immediately noted how this “major feature update” made Google’s product even more “like the ones made by Sonos:”

Google’s recently-launched Chromecast Audio adapter is getting a major feature update this week: Consumers will now be able to group multiple Chromecast audio adapters to stream their favorite music simultaneously in more than one room, similar to the multi-room support available for internet-connected loudspeakers like the ones made by Sonos.

Ex. 13 (2015 *Variety* article entitled “Google’s Chromecast Audio Adapter Gets Multi-Room Support Similar to Sonos”); *see also* Ex. 14 (2015 *Pocket-Lint*) (“You control your Sonos experience with one app. Well, thanks to a new software rollout, Chromecast Audio can pretty much do the same thing.”).

16. This has become a consistent pattern. Time and again, Google has added features to its products that first appeared in Sonos's products and which make use of Sonos's patented technology.

GOOGLE'S INFRINGEMENT ACCELERATES

17. Since 2015, Google's misappropriation of Sonos's patented technology has proliferated. Google has expanded its wireless multi-room audio system to more than a dozen infringing products, including the Google Home Mini, Google Home, Google Home Max, and Pixel phones, tablets, and laptops. And Google has persisted in infringing even though Sonos has warned Google of its infringement on at least four separate occasions dating back to 2016.

18. For example, in 2016 (a year after Google launched the Chromecast Audio wireless adapter), Google released the Google Home multi-room audio player (which was controlled by Google's rebranded multi-room controller app – the Google Home app). Unlike the Chromecast Audio, the Google Home added an internal speaker driver making it an “all-in-one” audio player akin to Sonos's prior Play:1, Play:3, and Play:5 products.

19. Sonos raised the issue of infringement as to these products with Google as early as August 2016. Sonos hoped that Google would respect Sonos's intellectual property and the extensive work Sonos had put into inventing and developing its products. But Google did no such thing.

20. In October 2016, Sonos put Google on notice of infringement of 28 Sonos patents, including asserted United States Patent No. 9,344,206. Google, however, did not stop infringing. Instead, it doubled down and introduced new infringing products, making use of *even more* patented technology from Sonos.

21. For example, in 2017, eight years after Sonos introduced its first all-in-one audio player – the Play:5 – Google released its first all-in-one audio players – the Google Home Max and the Google Home Mini. Google's Home Max in particular was seen as a “Sonos Clone” and a “not-so-subtle copy of the [Sonos] Play:5 speaker....” Ex. 15. As explained by Gizmodo, “[i]t's

also hard not to see the [Google Home Max] device as something of a jab at Sonos.” *Id.*; *see also*, e.g., Ex. 16 (2017 Android Central: “You can’t help but look at Google Home Max... and come to the conclusion that Google is sticking its nose where Sonos has been for years.”).

22. Therefore, in January 2018, and then again in July 2018, Sonos put Google on notice that it was infringing even more Sonos patents, including asserted United States Patent No. 9,219,460. Then again, in February 2019, Sonos put Google on notice of infringement of 100 Sonos patents, including asserted United States Patent No. 9,967,615.

23. Nothing Sonos did, however, deterred Google from expanding its infringement. Google’s infringing product line now includes at least the Chromecast, Chromecast Ultra, Chromecast Audio, Chromecast with Google TV, Home Mini, Nest Mini, Home, Home Max, Home Hub, Nest Hub, Nest Hub Max, Nest Audio, and Nest Wifi Point (individually or collectively, “Google Audio Player(s)”), all of which can be controlled by, for example, the YouTube Music app, the Google Play Music app, the YouTube app, and the Google Home app (individually or collectively, “Google App(s)”). *See, e.g.*, Exs. 17-27.

24. In addition to providing the Google Apps for controlling the Google Audio Players, Google also offers various infringing hardware controllers that are pre-installed with the Google Play Music app, YouTube app, and/or YouTube Music app (and capable of downloading and executing the Google Apps that are not pre-installed). These infringing hardware controllers include, for example, Google’s “Pixel” phones, tablets, and laptops (e.g., the Pixel 3, Pixel 3 XL, Pixel 3a, Pixel 3a XL, Pixel 4, Pixel 4 XL, and Pixel 4a phones, the Pixel Slate tablet, and the Pixelbook and Pixelbook Go laptops) (individually or collectively, “Google Pixel Device(s)”). *See, e.g.*, Exs. 28-32.

25. Herein, “Google Wireless Audio System” refers to one or more Google Audio Players, one or more Google Pixel Devices, and/or one or more Google Apps.

26. In order to hold Google accountable for its willful infringement of Sonos’s patents, Sonos filed a complaint in January 2020 asking the United States International Trade Commission (“ITC”) to institute an investigation into Google’s unlawful importation into and sale

in the United States of infringing products. The ITC instituted an investigation, *In re Certain Audio Players and Controllers, Components Thereof, and Products Containing Same*, Inv. No. 337-TA-1191 to determine whether Google’s audio players and controllers infringe five Sonos patents directed to fundamental features such as playing music on multiple speakers in synchrony, playing music in stereo over two or more players, a controller that can easily setup a player on a wireless network, and playback-control features such as controlling both the volume of individual speakers and a group of speakers.

27. While the ITC Investigation has been pending, Google has continued to increase its infringement. For example, press reports indicate that Google is introducing new products and changes that mean Google is “one step closer to replacing your Sonos system.” Ex. 33; *see also* Ex. 44 (“The new functionality appears to be the most direct challenge to the likes of Sonos, which has enjoyed enormous success by creating a series of connected speakers and soundbars that can play music simultaneously – or individually.”). The press has similarly noted that Google’s new speaker “could be a new rival for the likes of the Sonos One, the best smart speaker you can buy in 2020.” Ex. 34; *see also* Ex. 44 (“Just like Sonos, you can also change the volume on each speaker individually from the main interface.”). And press reports indicate that Google has expanded its use of Sonos’s stereo pair technology into the new smart-speakers even though Google is *currently* being sued for infringing a Sonos patent on this technology. Exs. 35, 44.

28. Google itself has also highlighted the importance of its use of Sonos’s technology. For example, Google’s Chris Chan publicly stated that “[c]ontrolling the audio throughout my home, no matter who’s listening, has been incredibly helpful” and that “[t]oday, we’re expanding that control. You can already manually group Nest devices in order to play the same music on various speakers at the same time, and now we’re launching multi-room control so you can dynamically group multiple cast-enabled Nest devices (speakers, Smart Displays, Chromecasts) in real-time to fill multiple rooms with music.” Ex. 35; *see also* Ex. 44. Again, Google has expanded its use of this technology *while* it is being sued for infringing Sonos’s patents on this precise technology.

29. Google’s aggressive and deliberate expansion of its use of Sonos’s patented technology has led observers to conclude that “[n]o market is safe from [the] search engine monster” and that Google was specifically “offering new products to compete with Sonos in the music streaming market.” *See* Ex. 36.

GOOGLE’S CONTINUED INFRINGEMENT FORCES THIS SUIT

30. In the face of Google’s unrelenting infringement, Sonos has no choice but to bring this suit. In this action, Sonos asserts patents that are not at issue in the ITC or the related district court action. Sonos is also accusing Google’s Wireless Audio System of infringing different patented features than are at issue in either of those actions.

31. Sonos’s ITC suit addressed Google’s infringement of Sonos patents covering fundamental aspects of wireless, whole-home audio systems. While groundbreaking, those patents represent only some of Sonos’s ongoing innovation from its inception to today. Through its foresight, substantial investment, and relentless pursuit of excellence, Sonos built on its previous success and invented a number of key features consumer have grown to expect and demand in streaming music listening.

32. For example, as explained more fully below, Sonos’s U.S. Patent Nos. 9,967,615 and 10,779,033 (the “615 Patent” and the “033 Patent,” respectively) cover key aspects of Sonos’s inventive approach for streaming music from a cloud-based service to a media playback system, including technology for transferring playback responsibility for a cloud-based stream of media content from a user’s device, such as a smart phone, to a media playback system that is then configured to retrieve and play back the cloud-based media content.

33. Sonos was well ahead of the field when it began to develop these inventions in 2011. At that time, Sonos’s audio system, including its smart-phone app controller, was in a category all its own. Moreover, streaming content from cloud-based media services for playback by computers – let alone other types of networked devices like smart phones and smart speakers – was in its infancy. Nonetheless, at a time years before Google released its first Chromecast

product, Sonos envisioned a novel experience of continuous and intuitive control of a user's entire streaming listening experience, across multiple networked devices, including smart phones and/or smart speakers. That vision gave rise to the innovation of technology for enabling seamless transition of playback responsibility for cloud-based media content between different networked devices, such as a smart phone and a smart speaker. This paradigm is now fundamental across the entire streaming industry as user expectations of continuous listening experiences have continued to converge with Sonos's vision.

34. Similarly, Sonos's U.S. Patent Nos. 9,344,206 and 10,469,966 (the "'206 Patent" and the "'966 Patent," respectively) cover some of Sonos's inventions related to creating, managing, and invoking "zone scenes" to configure how multiple players work together. With these patents, Sonos once again anticipated what consumers would want and invented a new feature for its system. Using the inventions of the '206 and '966 Patents, playback devices can be grouped together for synchronous playback in an easy and intuitive manner using "zone scenes." Advantageously, such a "zone scene" can be accessed and invoked by multiple devices and in various ways (*e.g.*, by voice) even when the particular controller that created the "zone scene" is not on the network.

35. In addition, Sonos's U.S. Patent No. 9,219,460 (the "'460 Patent") covers a Sonos invention related to dynamically adjusting the equalization of a playback device based on its environment. Naturally, consumers want their speakers to sound great, regardless of the environment in which the playback device is operating, but changes in the playback device's listening environment could impact sound quality. For example, a playback device may be configured to perform advantageously in a small room, but nonetheless may come to be positioned outdoors. When operating outdoors, boosting the bass levels of the playback may result in an improved listening experience for some consumers. However, previous technology for setting the equalization parameters for a playback device made it very difficult to optimize the playback device's equalization parameters for its listening environment. The '460 Patent provides technology that enables a playback device to adjust its own equalization settings based on one or

more reflection characteristics of an audio signal in order to optimally match the playback device's listening environment.

36. Sonos provided a pre-filing copy of this Complaint to Google, thereby providing clear pre-suit notice of infringement of the patents-in-suit. Google, however, has never given any indication that it is willing to stop infringing, and did not do so in response to receiving a draft of this complaint.

37. On information and belief, Google is unwilling to stop infringing because its infringement of Sonos's patented inventions has paved the way for Google to generate billions of dollars in revenue. A December 2018 market report by Royal Bank of Canada ("RBC"), for example, concluded that Google sold over 40 million Google Home devices in the U.S. and that Google generated \$3.4 billion in Google Home revenue in 2018 alone. Ex. 37 at pp. 1, 4, 14-15. RBC also found that, as of August 2017, Google had sold more than 55 million Chromecast devices and that Google generated almost \$1 billion in Chromecast revenue in 2018. *Id.* at pp. 4, 16, 18. Further, RBC estimated that, in 2018, Google generated \$3.4 billion in Pixel device revenue. *Id.* at pp. 4, 8.

38. By 2021, RBC estimates that Google will be annually selling over 100 million Google Home devices in the U.S. and generating over \$8 billion in Google Home revenue. *Id.* at pp. 4, 14-15. In addition, by 2021, RBC estimates that Google will annually generate \$2.4 billion in Chromecast revenue and nearly \$7 billion in Pixel device revenue. *Id.* at pp. 4, 8, 18.

39. The revenue obtained from the sale of Google's hardware devices vastly understates the value to Google of infringing Sonos's patents. On information and belief, Google is intentionally selling the infringing products at a discount and/or as a "loss leader" with the expectation that this will allow Google to generate even more revenue in the future – *e.g.*, by powering Google's continued dominance of the market for search advertising. In particular, Google's infringement of Sonos's patented inventions has helped and/or will help Google generate significant revenue from the use of Google's hardware devices including advertising, data collection, and search via the Google Wireless Audio Systems. As the *New York Post*

explained, “Amazon and Google both discounted their home speakers so deeply over the holidays that they likely lost a few dollars per unit ... hoping to lock in customers and profit from later sales of goods and data about buying habits.” Ex. 38. Similarly, *News Without Borders* explained that companies like Google are using their “smart speaker” devices as “‘loss leader[s]’ to support advertising or e-commerce.” Ex. 39.

40. On information and belief, Google’s copying of Sonos’s patented inventions has also helped and/or will help Google generate significant revenue from driving its users to make purchases such as streaming music subscriptions and retail purchases via the Google Wireless Audio Systems. For example, an NPR “smart speaker” survey found that 28% of survey respondents agreed that “[g]etting [a] Smart Speaker led [them] to pay for a music service subscription,” and Google offers two such subscriptions – Google Play Music and YouTube Music. Ex. 40 at p. 20. Likewise, the NPR survey also found that 26% of respondents use their smart speakers “regularly” to “add [items] to shopping list.” *Id.* at p. 14; *see also, e.g.*, Ex. 39 (stating that companies like Google are using their “smart speaker” devices as “‘loss leader[s]’ to support... e-commerce.”).

41. On information and belief, Google is willfully infringing Sonos’s patents as part of Google’s calculated strategy to vacuum up invaluable consumer data from users and, thus, further entrench the Google platform among its users and fuel its dominant advertising and search platforms.

42. Google’s infringement – and its strategy to sell its infringing products at a loss to develop alternative revenue streams – has caused significant damage to Sonos. For example, the Google Home Mini predatorily implemented Sonos’s valuable patented technology into an all-in-one wireless multi-room product that Google sells at a highly subsidized price point or even gives away for free. Ex. 41 (“At \$49, Google Home Mini works on its own or you can have a few around the house, giving you the power of Google anywhere in your home.”); Ex. 39 (“Google partnered with Spotify to offer Home Minis as a free promotion for Spotify Premium customers.

Spotify's premium userbase is nearly 90 million, so if even a fraction of users take the free offer, a massive influx of Google smart speakers will enter the market.'").

THE PARTIES

43. Plaintiff Sonos, Inc. is a Delaware corporation with its principal place of business at 614 Chapala Street, Santa Barbara, California 93101. Sonos is the owner of the patents-in-suit. Sonos holds all substantial rights, title and interest in and to the Asserted Patents.

44. Defendant Google LLC is a Delaware limited liability corporation with its principal place of business at 1600 Amphitheatre Parkway, Mountain View, CA 94043. Google maintains a physical address in this district at 500 West 2nd Street, Austin, Texas, 78701. Google may be served with process through its registered agent, the Corporation Service Company, at 211 East 7th Street, Suite 620, Austin Texas 78701. Google is registered to do business in the State of Texas and has been since at least November 17, 2006.

45. Google LLC is one of the largest technology companies in the world and conducts product development, engineering, sales, and online retail, search, and advertising operations in this District.

46. Google LLC directly and/or indirectly develops, designs, manufactures, distributes, markets, offers to sell, sells, and/or imports the infringing Google Wireless Audio System at issue in this litigation in/into the United States, including in the Western District of Texas, and otherwise purposefully directs infringing activities to this District in connection with its Google Wireless Audio System.

JURISDICTION AND VENUE

47. This action for patent infringement arises under the Patent Laws of the United States, 35 U.S.C. § 1 et. seq. This Court has original jurisdiction under 28 U.S.C. §§ 1331 and 1338.

48. This Court has personal jurisdiction over Google because, pursuant to Fed. R. Civ. P. 11(b)(3), Google has: (1) availed itself of the rights and benefits of the laws of the State of Texas, (2) transacted, conducted, and/or solicited business and engaged in a persistent course of

conduct in the State of Texas (and in this District), (3) derived substantial revenue from the sales and/or use of products, such as the infringing Google Wireless Audio System, in the State of Texas (and in this District), (4) purposefully directed activities (directly and/or through intermediaries), such as shipping, distributing, offering for sale, selling, and/or advertising its infringing Google Wireless Audio System, at residents of the State of Texas (and residents in this District), (5) delivered its infringing Google Wireless Audio System into the stream of commerce with the expectation that the Google Wireless Audio System will be used and/or purchased by consumers, and (6) committed acts of patent infringement in the State of Texas (and in this District).

49. This Court also has personal jurisdiction over Google because it is registered to do business in the State of Texas and has one or more regular and established places of business in the Western District of Texas.

50. Venue is proper in this District under the provisions of 28 U.S.C. § 1400(b) because, as noted above, Google has committed acts of infringement in this district and has one or more regular and established places of business in this district. Google has also repeatedly admitted that venue is proper in this District for various patent cases. *See e.g., Solas OLED Ltd. v. Google, Inc.* (WDTX Case No. 6-19-cv-00515) and *VideoShare, LLC v. Google LLC et al* (WDTX Case No. 6-19-cv-00663).

THE PATENTS-IN-SUIT

U.S. Patent No. 9,967,615

51. Sonos is the owner of U.S. Patent No. 9,967,615 (the “’615 Patent”), entitled “Networked Music Playback,” which was duly and legally issued by the United States Patent and Trademark Office (“USPTO”) on May 8, 2018. A copy of the ’615 Patent, is attached hereto as Exhibit 1.

52. The ’615 Patent relates generally to technology for facilitating transfer of playback responsibility from a user’s device to a media playback system.

53. The '615 Patent recognized that “[t]echnological advancements have increased the accessibility of music content, as well as other types of media...” ’615 Patent at 1:19-20. This allowed users to access audio and video content over the Internet. *Id.* at 1:21-26.

54. But, the '615 Patent identified a particular problem and provided an unconventional technological solution. Specifically, the patent recognized that “[w]ired or wireless networks can be used to connect one or more multimedia playback devices for a home or other location playback network (*e.g.*, a home music system).” ’615 Patent at 1:66-2:2. This means that “[m]usic and/or other multimedia content can be shared among devices and/or groups of devices (also referred to herein as zones) associated with a playback network.” *Id.* at 2:6-9. The '615 Patent is directed to a method, tangible media, and controller that “facilitate streaming or otherwise providing music from a music-playing application (*e.g.*, browser-based application, native music player, other multimedia application, and so on) to a multimedia content playback (*e.g.*, SonosTM) system.” *Id.* at 2:10-14.

55. The '615 Patent provides an unconventional technological solution to this problem. For example, the '615 Patent describes an “Example Controller” that “can be used to facilitate the control of multi-media applications....” ’615 Patent at 9:8-14. “In particular, the controller 500 is configured to facilitate a selection of a plurality of audio sources available on the network and enable control of one or more zone players ... through a wireless network interface 508.” *Id.* at 9:14-18. Further, the '615 Patent describes embodiments that “enable a user to stream music from a music-playing application (*e.g.*, browser-based application, native music player, other multimedia application and so on) to a local multimedia content playback (*e.g.*, SonosTM) system.” ’615 Patent at 12:8-12. More specifically, the '615 Patent teaches that while “a user listens to a third party music application (*e.g.*, PandoraTM RhapsodyTM, SpotifyTM, and so on)” on a user device, such as the user’s “smart phone,” the user can “select[] an option to continue playing [the current] channel on her household music playback system (*e.g.*, SonosTM),” which will cause the user’s “playback system” to “pick[] up from the same spot on the selected channel that was

on her phone and output[] that content (*e.g.*, that song) on speakers and/or other playback devices connected to the household playback system.” *Id.* at 12:44-53; *see also id.* at 13:1-53.

56. The ’615 Patent goes on to teach specific technology for facilitating this transfer of playback responsibility from the user’s device to the user’s playback system. For instance, the ’615 Patent teaches that one aspect of this technology involves causing data for retrieving network-based media content (such as a uniform resource locator (URI)) to be passed to a playback device in the playback system so that the playback device can “run on its own to fetch the content” from a networked audio source, such as a “cloud” server that is accessible over the Internet. *Id.* at 12:53-63; *see also id.* at 12:63-67 (describing that “[a] third party application can open or utilize an application programming interface (API) to pass music to the household playback system without tight coupling to that household playback system”); 15:47-16:19 (describing a “throw it over the wall” approach in which “a third party application provides a multimedia playback device (*e.g.*, a Sonos™ zone player (ZP)) with enough information about content (*e.g.*, an audio track) so that . . . the local playback system (*e.g.*, SonosNet™) can directly access a source of the content and . . . play the content directly off the network (*e.g.*, the Internet) or cloud,” where the “connection between the third-party application and the local playback device (*e.g.*, Sonos ZonePlayer™) can be direct over a local area network (LAN)” or “remote through a proxy server in the cloud”); 16:53-17:4 (describing various embodiments for “queue management” associated with the transfer of playback from a control device to a playback system, including an embodiment where a “shared queue is provided between the local playback system and the third party application to keep the local system and the application synchronized”). Further, the ’615 Patent teaches that another aspect of this technology involves transitioning the user’s device into a mode in which it functions to control the playback of the media content by the user’s playback system after the transfer. *Id.* at 16:20-42, 17:5-20. In this way, the technology taught by the ’615 Patent provides for intuitive and seamless transfer of playback responsibility from a user’s device to a media playback system.

57. In line with these teachings, the '615 Patent claims devices, computer-readable media, and methods for facilitating transfer of playback responsibility from a user's device to a media playback system.

58. For example, claim 13 of the '615 Patent recites a non-transitory computer readable storage medium including instructions for execution by a processor that, when executed, cause a control device to perform various functions that facilitate transfer of playback responsibility from the device to a media playback system. *See* '615 Patent, claim 13. When the instructions are executed, the control device is initially operable to (i) cause a graphical interface to display a control interface including one or more transport controls to control playback by the control device, (ii) identify playback devices connected to a local area network, (iii) cause the graphical interface to display a selectable option for transferring playback from the control device, and (iv) detect a set of inputs to transfer playback from the control device to a particular playback device. *Id.* Additionally, the instructions configure the control device so that, after detecting the set of inputs to transfer playback from the control device to the particular playback device, the control device is operable to cause playback to be transferred from the control device to the particular playback device by (a) causing one or more first cloud servers to add multimedia content to a local playback queue on the particular playback device, wherein adding the multimedia content to the local playback queue comprises the one or more first cloud servers adding, to the local playback queue, one or more resource locators corresponding to respective locations of the multimedia content at one or more second cloud servers of a streaming content service, (b) causing playback at the control device to be stopped, and (c) modifying the one or more transport controls of the control interface to control playback by the playback device. *Id.* Additionally yet, the instructions configure the control device so that the control device is operable to cause the particular playback device to play back the multimedia content, which involves the particular playback device retrieving the multimedia content from one or more second cloud servers of a streaming content service and playing back the retrieved multimedia content. *Id.*

U.S. Patent No. 10,779,033

59. Sonos is the owner of U.S. Patent No. 10,779,033 (the “’033 Patent”), entitled “Systems And Methods For Networked Music Playback,” which was duly and legally issued by the United States Patent and Trademark Office (“USPTO”) on September 15, 2020. A copy of the ’966 Patent, is attached hereto as Exhibit 2.

60. The ’033 Patent is related to the ’615 Patent in that they are both continuations of application No. 13/341,237, filed on December 30, 2011, now U.S. Patent No. 9,654,821. Thus, the ’033 and ’615 Patents share essentially the same specification. Sonos incorporates by reference and re-alleges paragraphs 52-58 of this Complaint as if fully set forth herein.

61. Like the ’615 Patent, the ’033 Patent claims devices, computer-readable media, and methods for facilitating transfer of playback responsibility from a user’s device to a media playback system, which provide an unconventional solution to the technological problem described in the ’615 Patent.

62. For example, claim 1 of the ’033 Patent recites a computing device with specific hardware configurations, including a non-transitory computer-readable medium that stores program instruction that can be executed by the device’s processor(s). *See* ’033 Patent, claim 1. When the instructions are executed, the computing device can initially operate in a first mode in which it is configured for playback of a remote playback queue provided by a cloud-based computing system associated with a cloud-based media service. *Id.* In that mode, the computing device is operable to (i) display a representation of one or more playback devices in a media playback system that are communicatively coupled to the computing device over a data network and available to accept playback responsibility for the remote playback queue, and (ii) while displaying the representation of the one or more playback devices, receive user input indicating a selection of at least one given playback device from the one or more playback devices. *Id.* Additionally, the instructions configure the computing device so that, based on receiving the user input, the computing device is operable to transmit an instruction for the at least one given playback device to take over responsibility for playback of the remote playback queue from the

computing device, wherein the instruction configures the at least one given playback device to (i) communicate with the cloud-based computing system in order to obtain data identifying a next one or more media items that are in the remote playback queue, (ii) use the obtained data to retrieve at least one media item in the remote playback queue from the cloud-based media service; and (iii) play back the retrieved at least one media item. *Id.* Additionally yet, the instructions configure the computing device so that the computing device is operable to detect an indication that playback responsibility for the remote playback queue has been successfully transferred from the computing device to the at least one given playback device, and then after detecting the indication, transition from (a) the first mode in which the computing device is configured for playback of the remote playback queue to (b) a second mode in which the computing device is configured to control the at least one given playback device's playback of the remote playback queue and the computing device is no longer configured for playback of the remote playback queue. *Id.*

U.S. Patent No. 9,344,206

63. Sonos is the owner of U.S. Patent No. 9,344,206 (the “’206 Patent”), entitled “Method And Apparatus For Updating Zone Configurations In A Multi-Zone System,” which was duly and legally issued by the United States Patent and Trademark Office (“USPTO”) on May 17, 2016. A copy of the ’206 Patent, is attached hereto as Exhibit 3.

64. The ’206 Patent relates generally to consumer electronics and human-computer interaction and, more specifically, to controlling or manipulating a plurality of multimedia players in a multi-zone system. *See, e.g.*, ’206 Patent at 1:25-29.

65. The ’206 Patent recognized that users demand not only quality audio reproduction but also a system that allows multiple players to access music from different sources. ’206 Patent at 1:30-40. Before the ’206 Patent, a conventional multi-zone audio system might include a number of audio sources, but each audio source had to be connected to its own amplifier and a set of speakers and was typically installed in one place. *Id.* at 1:40-44. This had inherent limitations. “In order to play an audio source at one location, the audio source must be provided locally or

from a centralized location. When the audio source is provided locally, the multi-zone audio system functions as a collection of many stereo systems, making source sharing difficult. When the audio source is provided centrally, the centralized location may include a juke box, many compact discs, an AM or FM radio, tapes, or others. To send an audio source to an audio player demanding such source, a cross-bar type of device is used to prevent the audio source from going to other audio players that may be playing other audio sources.” *Id.* at 1:44-44.

66. Moreover, as the '206 Patent recognized, “[i]n order to achieve playing different audio sources in different audio players, the traditional multi-zone audio system is generally either hard-wired or controlled by a pre-configured and pre-programmed controller.” '206 Patent at 1:56-59. Such a system created problems. “While the pre-programmed configuration may be satisfactory in one situation, it may not be suitable for another situation. For example, a person would like to listen to broadcast news from his/her favorite radio station in a bedroom, a bathroom and a den while preparing to go to work in the morning. The same person may wish to listen in the den and the living room to music from a compact disc in the evening. In order to satisfy such requirements, two groups of audio players must be established. In the morning, the audio players in the bedroom, the bathroom and the den need to be grouped for the broadcast news. In the evening, the audio players in the den and the living room are grouped for the music. Over the weekend, the audio players in the den, the living room, and a kitchen are grouped for party music. Because the morning group, the evening group and the weekend group contain the den, it can be difficult for the traditional system to accommodate the requirement of dynamically managing the ad hoc creation and deletion of groups.” *Id.* at 1:59-2:10.

67. Thus, the '206 Patent recognized “a need for dynamic control of the audio players as a group” and a system in which “the audio players may be readily grouped.” '206 Patent at 2:11-13. The invention of the '206 Patent would, thus, overcome the problems “in a traditional multi-zone audio system [where] the audio players have to be adjusted one at a time, resulting in an inconvenient and non-homogenous audio environment.” *Id.* at 2:13-16.

68. The '206 Patent provided an unconventional solution to this technological problem. “In general, the present invention pertains to controlling a plurality of multimedia players, or simply players, in groups.” '206 Patent at 2:28-29. One specific aspect of the grouping technology that is taught by the '206 Patent involves a controller with a user interface that permits a user to configure and save a “zone scene,” which may comprise a “predefined” grouping of zone players that can later be “activated” (or “invoked”) in order to group the zone players in the “zone scene” together for synchronous playback. *Id.* at 2:30-53, 2:60-3:4, 8:19-10:45. The '206 Patent explains that this “zone scene” technology for grouping zone players together for synchronous playback provides improvements over the existing technology for grouping zone players together for synchronous playback, which involved defining the group membership at the time that the group was to be invoked – particularly in situations where a larger number of zone players are to be grouped together for synchronous playback. *Id.* at 8:19-55. For instance, the benefits highlighted by the '206 Patent include (i) allowing a group of zone players to be “predefined” as part of a “zone scene” so that the group’s membership need not be defined at the time that the group is to be invoked, (ii) allowing a predefined group to be invoked without requiring the zone players in the group to be separated from other groups beforehand, and (iii) allowing zone players to exist as part of multiple different predefined groups that can be invoked in order to dynamically group the zone players for synchronous playback. *Id.* at 8:19-10:45.

69. In line with these teachings, the '206 Patent claims devices, computer-readable media, and methods for managing and using “zone scenes” to facilitate grouping of zone players. For example, claim 1 of the '206 Patent recites a “multimedia controller including a processor” that is configured to (i) receive, via a network interface, a zone configuration from a first independent playback device of a plurality of independent playback devices, wherein the zone configuration is configured via the controller and maintained at the first independent playback device, and wherein the zone configuration characterizes one or more zone scenes, each zone scene identifying a group configuration associated with two or more of the plurality of independent playback devices, and (ii) cause a selectable indication of the received zone

configuration to be displayed, wherein the displayed selectable indication is selectable to cause one or more of the zone scenes to be invoked by two or more of the plurality of independent playback devices. *See* '206 Patent, claim 1.

U.S. Patent No. 10,469,966

70. Sonos is the owner of U.S. Patent No. 10,469,966 (the “’966 Patent”), entitled “Zone Scene Management,” which was duly and legally issued by the United States Patent and Trademark Office (“USPTO”) on November 5, 2019. A copy of the ’966 Patent, is attached hereto as Exhibit 4.

71. The ’966 Patent is related to the ’206 Patent in that they are both continuations of application No. 13/896,829, filed on May 17, 2013, now U.S. Patent No. 8,843,228. Thus, the ’966 and ’206 Patents share essentially the same specification. Sonos incorporates by reference and re-alleges paragraphs 64-69 of this Complaint as if fully set forth herein.

72. The ’906 Patent claims devices, computer-readable media, and methods for managing and using “zone scenes” to facilitate grouping of zone players, which provides an unconventional solution to the technological problems related to grouping zone players that are described in the ’906 Patent.

73. For example, claim 1 of the ’966 Patent describes a computing device with a processor that can execute instructions stored in the controllers non-transitory, computer-readable medium. Those instructions, when executed, cause the computing device to be operable to (i) receive a first request to create a first zone scene comprising a first predetermined grouping of zone players that are to be configured for synchronous playback when the first zone scene is invoked, and (ii) based on the first request, cause creation of the first zone scene, cause an indication of the first zone scene to be transmitted to a first zone player in the first zone scene, and cause storage of the first zone scene. *See, e.g.*, ’966 Patent, claim 1. Additionally, the instructions, when executed, cause the computing device to be operable to (i) receive a second request to create a second zone scene comprising the first zone player and at least one other zone player that is not in the first zone scene, and (ii) based on the second request, cause creation of

the second zone scene, cause an indication of the second zone scene to be transmitted to the first zone player, and cause storage of the second zone scene. *Id.* Additionally yet, the instructions, when executed, cause the computing device to be operable to (i) display representations of the first and second zone scenes, (ii) while displaying the representations, receive a third request to invoke the first zone scene, and (iii) based on the third request, cause the first zone player to transition from operating in a standalone mode to operating in accordance with the first predefined grouping of zone players so that the first zone player is configured to coordinate with at least the second zone player to output media in synchrony with output of media by at least the second zone player. *Id.*

U.S. Patent No. 9,219,460

74. Sonos is the owner of U.S. Patent No. 9,219,460 (the “’460 Patent”), entitled “Audio Settings Based on Environment,” which was duly and legally issued by the United States Patent and Trademark Office (“USPTO”) on December 22, 2015. A copy of the ’460 Patent, is attached hereto as Exhibit 5.

75. The ’460 Patent relates generally to “consumer goods and, more particularly, to methods, systems, products, features, services, and other elements directed to media playback or some aspect thereof.” ’460 Patent at 1:6-9. More specifically, the ’460 Patent is directed to dynamically adjusting the equalization of a playback device based on the environment in which the playback device is operating. *See, e.g., id.* at 1:64-66.

76. The ’460 Patent recognized that “[w]hile a playback device may be factory configured to perform advantageously in a typical operating environment, the factory configuration may not be ideal for all environments.” ’460 Patent at 1:66-2:2. According to the ’460 Patent, “adjusting the equalization of the playback device based on the current operating environment may improve the listening experience for some listeners.” *Id.* at 2:3-5.

77. The ’460 Patent recognized that there are several problems with existing technology for adjusting an audio player’s equalization. ’460 Patent at 2:12-14. For instance:

First, the adjustment process is often overlooked by the user because, for example, the user may be required to initiate the adjustment and position the microphone. Second, the adjustment process requires a separate microphone, which may not be included with any of the components of the audio system. Third, the manual approach does not lend itself to frequent adjustment when one or more of the speakers may be re-positioned in different locations throughout a home or outdoors.

Id. at 2:23-32.

78. The '460 Patent provides an unconventional technological solution to these problems. For example, the '460 Patent discloses a playback device that “emit[s] an audio signal, such as a pulse, . . . [which] may encounter various objects, such as walls and furniture, throughout the environment.” '460 Patent at 2:37-42. The '460 Patent further discloses that “[w]hen an object is encountered, the object may variably reflect or absorb portions of the audio signal,” and “[a]t some point, a portion of the reflected audio signal may reflect back toward the playback device from which the audio signal was emitted.” *Id.* at 2:42-50. According to the '460 Patent, “[t]he microphone of the playback device may then detect at least a portion of the reflected audio signal,” and “[i]n response to detecting the reflected audio signal, the playback device may determine one or more reflection characteristics based on the reflected audio signal.” *Id.* at 2:50-55. Moreover, the '460 Patent discloses that “[t]he playback device may then adjust an equalization setting of the playback device based on the one or more reflection characteristics,” and “[o]nce the equalization setting is adjusted, the playback device may then play an audio track according to the equalization setting.” *Id.* at 3:6-26.

79. In line with these teachings, the '460 Patent claims devices, systems, and methods for dynamically adjusting the equalization of a playback device based on the environment in which the playback device is operating, which provide an unconventional solution to the technological problems described in the '460 Patent. For example, claim 15 of the '460 Patent describes a playback device with a speaker, a microphone that is physically coupled to the speaker, a processor, a network interface, a data storage, and a program logic stored in the data storage and executable by the processor. The program logic, when executed, causes the playback device to be operable to (i) emit a first audio signal from the speaker, and (ii) detect a second audio signal via the microphone that is physically coupled to the speaker, where at least a portion of the second

audio signal is a reflection of the first audio signal. *See* '460 Patent, claim 15. Additionally, the program logic, when executed, causes the playback device to be operable to (i) in response to detecting the second audio signal, determine a first reflection characteristic based on at least the second audio signal, (ii) adjust an equalization setting of the playback device based on at least the first reflection characteristic, and (iii) play, via the speaker, an audio track according to the adjusted equalization setting. *Id.*

COUNT I: INFRINGEMENT OF U.S. PATENT NO. 9,967,615

80. Sonos incorporates by reference and re-alleges paragraphs 1-79 of this Complaint as if fully set forth herein.

81. Google and/or users of the Google Wireless Audio System have directly infringed (either literally or under the doctrine of equivalents) and continue to directly infringe one or more of the claims of the '615 Patent, in violation of 35 U.S.C. § 271(a), by making, using, offering for sale, and/or selling the Google Wireless Audio System within the United States and/or importing the Google Wireless Audio System into the United States without authority or license.

82. As just one non-limiting example, set forth below is an exemplary infringement claim chart for claim 13 of the '615 Patent in connection with the Google Wireless Audio System. This claim chart is based on publicly available information. Sonos reserves the right to modify this claim chart, including, for example, on the basis of information about the Google Wireless Audio System that it obtains during discovery.

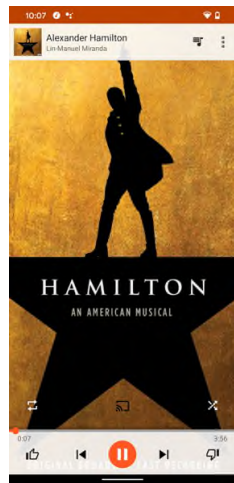
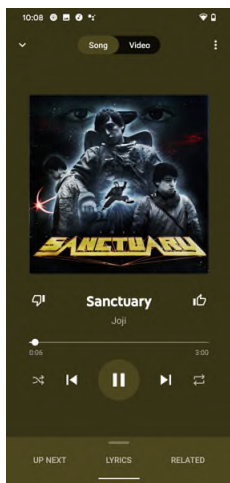
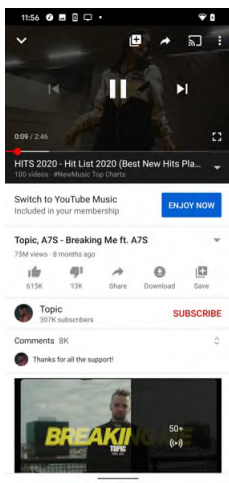
Claim: 13	Chromecast-Enabled Computing Devices
A tangible, non-transitory computer readable storage medium including instructions for	At least each smartphone, tablet, and computer running the YouTube Music app, the Google Play Music app, the YouTube app and/or other native or web-based Chromecast-enabled apps (where a computing device installed with at least one of these Chromecast-enabled apps is referred to herein as a “Chromecast-enabled computing device” ^{1,2})


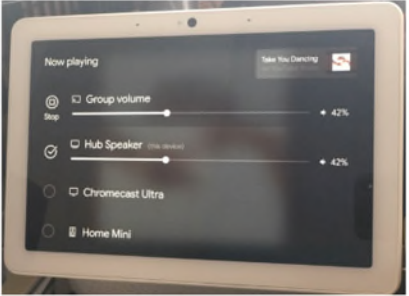
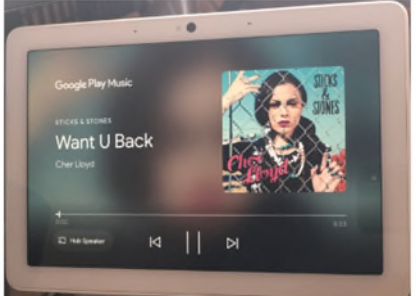
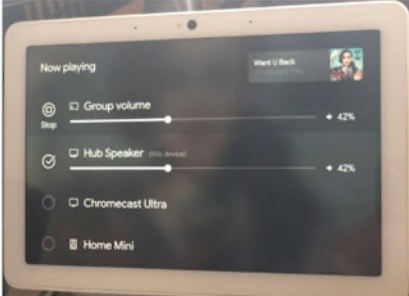
¹ Any reference to a “Chromecast-enabled computing device” or “Chromecast-enabled media player” includes each version and generation of such device/player unless otherwise noted.

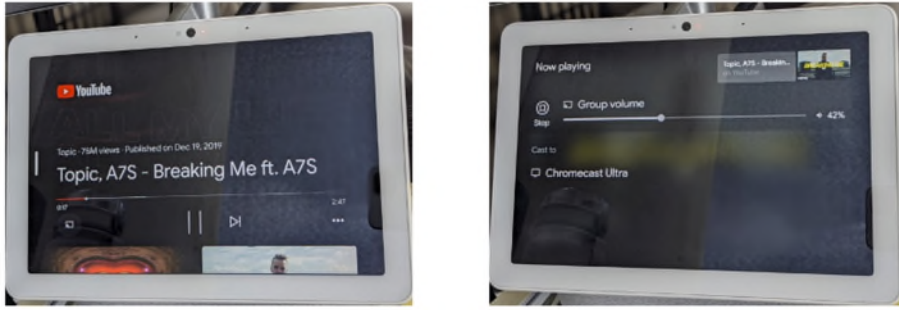
² Each Google “Pixel” smartphone, tablet, and computer (*e.g.*, the Pixel 3, Pixel 3 XL, Pixel 3a, Pixel 3a XL, Pixel 4, Pixel 4 XL, and Pixel 4a phones, the Pixel Slate tablet, and the Pixelbook






Claim: 13	Chromecast-Enabled Computing Devices
<p>execution by a processor, the instructions, when executed, cause a control device to implement a method comprising:</p>	<p>comprises a “control device,” as recited in claim 13. At least each Home Mini, Nest Mini, Home, Home Max, Home Hub, Nest Hub, Nest Hub Max, Nest Wifi Point, Chromecast, Chromecast Audio, Chromecast Ultra, Chromecast with Google TV, and Nest Audio (“Chromecast-enabled media player”) is a data network device configured to process and output audio, and thus, comprises a “playback device” as recited in claim 13. <i>See, e.g.,</i> https://store.google.com/us/magazine/compare_pixel; https://store.google.com/us/product/google_pixelbook_specs; https://store.google.com/us/product/pixel_slate_specs; https://store.google.com/us/product/google_home_max?hl=en-US; https://store.google.com/us/product/google_home_max_partners?hl=en-US; https://store.google.com/product/chromecast_apps?utm_source=chromecast.com.</p> <p>In addition to being a “playback device” as recited in claim 13, each Home Hub, Nest Hub, and Nest Hub Max (referred to herein as a “Hub media player”) is installed with Home/Nest Hub controller software such that the given Hub media player also comprises a “control device,” as recited in claim 13. <i>See, e.g.,</i> https://store.google.com/us/product/google_nest_hub?hl=en-US#overview-modal-music; https://store.google.com/us/product/google_nest_hub_max?hl=en-US; https://support.google.com/googlenest/answer/9165738?hl=en-GB&ref_topic=7030084.</p> <p>Each Chromecast-enabled computing device includes a tangible, non-transitory computer-readable storage medium comprising instructions that, when executed by a Chromecast-enabled computing device’s processor, cause that Chromecast-enabled computing device to perform the functions identified below. <i>See, e.g.,</i> https://store.google.com/us/magazine/compare_pixel; https://store.google.com/us/product/google_pixelbook_specs; https://store.google.com/us/product/pixel_slate_specs. Likewise, each Hub media player includes a tangible, non-transitory computer-readable storage medium comprising instructions that, when executed by a Hub media player’s processor, cause that Hub media player to perform the functions identified below. <i>See, e.g.,</i> https://store.google.com/us/product/google_home_max?hl=en-US.</p>

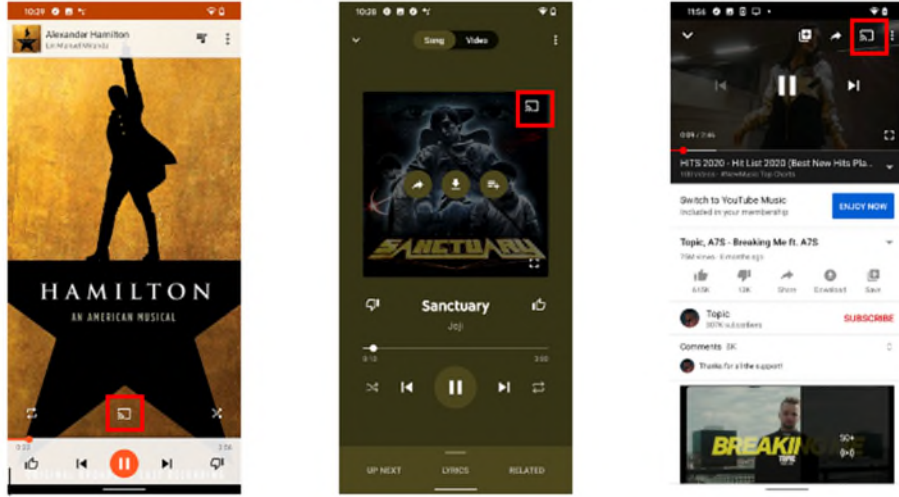
and Pixelbook Go laptops) running the YouTube Music app, the Google Play Music app, the YouTube app, the Google Home app, and/or other native or web-based Chromecast-enabled app is an example of a “Chromecast-enabled computing device.”





Claim: 13	Chromecast-Enabled Computing Devices
<p>causing a graphical interface to display a control interface including one or more transport controls to control playback by the control device;</p>	<p>Each Chromecast-enabled computing device comprises instructions that, when executed by a Chromecast-enabled computing device's processor, cause its graphical interface to display a control interface including one or more transport controls to control playback by the Chromecast-enabled computing device.</p> <p>For instance, each Chromecast-enabled computing device is programmed with the capability to cause its graphical interface to display a control interface having one or more transport controls that, at times, are configured to control the Chromecast-enabled computing device's playback of multimedia content from a streaming content service, among other media sources. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084 ("You can even use your mobile device or tablet as a remote and control everything from playback to volume."); https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en ("Using your phone or tablet: [] You can use the playback controls on the Google Play Music app . . . Using your computer: [] You can use the playback controls on Google Play Music, near the bottom of the screen."); https://support.google.com/chromecast/answer/2995235?hl=en-AU; https://support.google.com/googlenest/answer/7030379?co=GENIE.Platform%3DAndroid&hl=en-GB; https://support.google.com/chromecast/answer/3265953?hl=en-GB&ref_topic=4602553. Examples of this functionality are illustrated in the following screenshots from a Chromecast-enabled computing device running at least the YouTube Music, Google Play Music, and YouTube apps:</p> <div>  </div> <div>  </div> <div>  </div> <p>Likewise, each Hub media player comprises instructions that, when executed by a Hub media player's processor, cause its graphical</p>

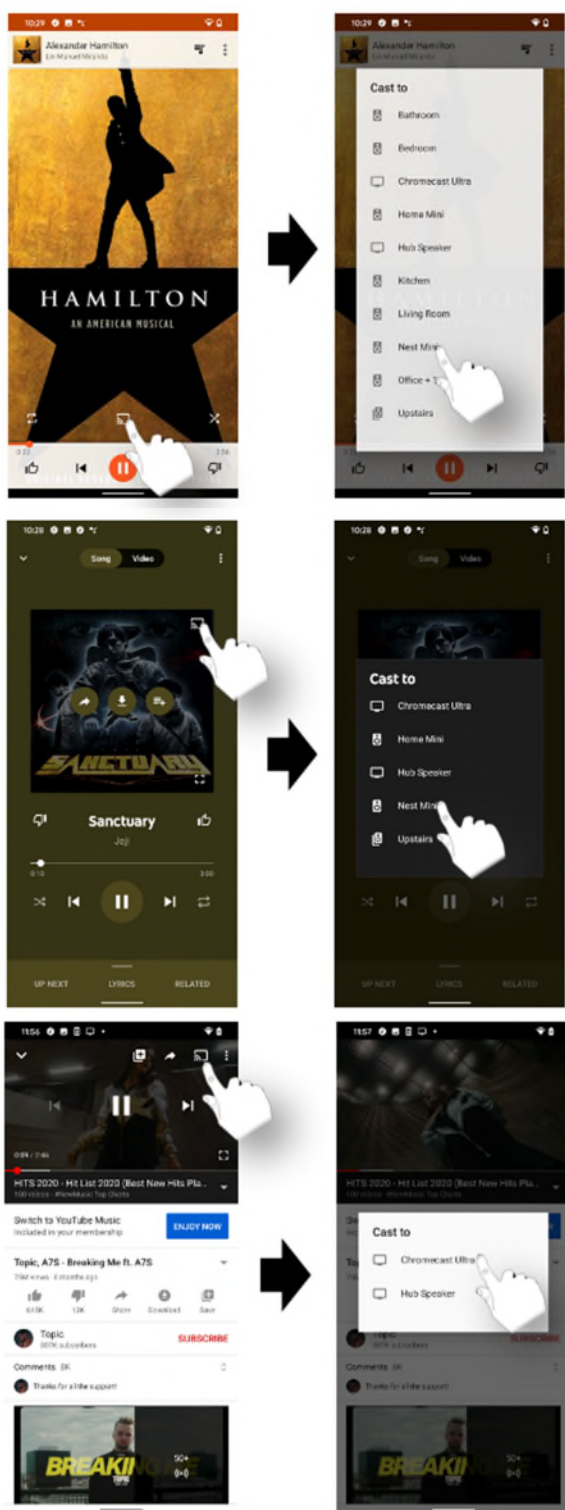
Claim: 13	Chromecast-Enabled Computing Devices
	<p>interface to display a control interface including one or more transport controls to control playback by the Hub media player.</p> <p>For instance, each Hub media player is programmed with the capability to cause its graphical interface to display a control interface having one or more transport controls that, at times, are configured to control the Hub media player's playback of multimedia content from a streaming content service, among other media sources. <i>See, e.g.,</i> https://store.google.com/us/product/google_nest_hub?hl=en-US#overview-modal-music (“YouTube Music on demand. . . . Stream top music services.”); https://store.google.com/us/product/google_nest_hub_max?hl=en-US (“jam out with YouTube Music.”); https://support.google.com/googlenest/answer/9165738?hl=en-GB&ref_topic=7030084 (“With YouTube built-in to your Google Nest display, you can watch YouTube Originals, how-to videos and much more, seamlessly on your screen.”). Examples of this functionality are illustrated in the following screenshots from a Hub media player running at least the YouTube Music, Google Play Music, and YouTube apps:</p> <div>  </div> <div>  </div> <div>  </div> <div>  </div>


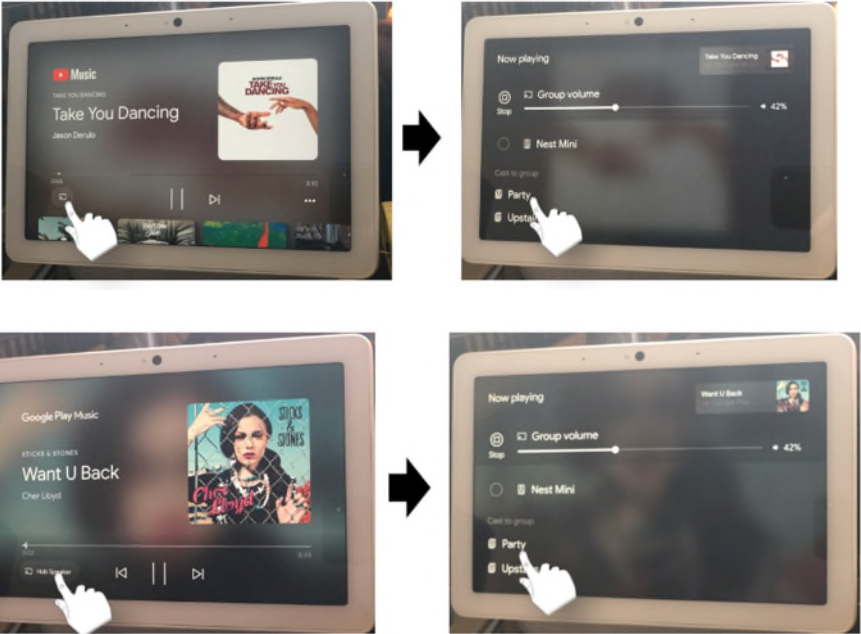
Claim: 13	Chromecast-Enabled Computing Devices
	
<p>after connecting to a local area network via a network interface, identifying playback devices connected to the local area network;</p>	<p>Each Chromecast-enabled computing device comprises instructions that, when executed by a Chromecast-enabled computing device's processor, cause that Chromecast-enabled computing device to, after connecting to a local area network ("LAN") via a network interface, identify Chromecast-enabled media players connected to the LAN.</p> <p>For instance, each Chromecast-enabled computing device is programmed such that, after connecting to a LAN, the Chromecast-enabled computing device is configured to identify one or more Chromecast-enabled media players connected to that same LAN. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084 ("Make sure that your mobile device or tablet is connected to the same Wi-Fi network or linked to the same account as your Google Nest or Home speaker or display. . . . Tap the speaker or display for which you'd like to cast."); https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en ("Connect your phone or tablet and Chromecast to the same wireless network. . . . Select your Chromecast device from the device list."); https://support.google.com/chromecast/answer/2995235?hl=en-AU ("Make sure that your mobile device or computer is connected to the same Wi-Fi network as Chromecast. . . . Tap the Chromecast device to which you want to cast."); https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1 ("To show Chrome on your TV, you'll need . . . [t]o connect your computer and Chromecast device to the same Wi-Fi network."); https://support.google.com/chromecast/answer/3265953?hl=en-GB&ref_topic=4602553.</p> <p>Likewise, each Hub media player comprises instructions that, when executed by a Hub media player's processor, cause that Hub media player to, after connecting to a LAN via a network interface, identify Chromecast-enabled media players connected to the LAN.</p> <p>For instance, each Hub media player is programmed such that, after connecting to a LAN, the Hub media player is configured to identify</p>



Claim: 13	Chromecast-Enabled Computing Devices
	<p>one or more Chromecast-enabled media players connected to that same LAN. <i>See</i>, e.g., https://support.google.com/googlenest/answer/9563059?hl=en-GB&ref_topic=7030084 (“At the bottom-left corner of the screen, tap Devices  to see the list of available devices and speaker groups.”).</p>
<p>causing the graphical interface to display a selectable option for transferring playback from the control device;</p>	<p>Each Chromecast-enabled computing device comprises instructions that, when executed by a Chromecast-enabled computing device’s processor, cause its graphical interface to display a selectable option for transferring playback from the Chromecast-enabled computing device.</p> <p>For instance, each Chromecast-enabled computing device is programmed with the capability to cause its graphical interface to display a selectable option (e.g., a selectable “Cast button”) for transferring playback of multimedia content from the Chromecast-enabled computing device to another device (e.g., a Chromecast-enabled media player). <i>See</i>, e.g., https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084 (“Tap the Cast button . . . Tap the speaker or display for which you'd like to cast.”); https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en (“Tap the Cast button . . . Select your Chromecast device from the device list.”); https://support.google.com/chromecast/answer/2995235?hl=en-AU (“Tap the Cast button . . . Tap the Chromecast device to which you want to cast.”); https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1 (“2. At the top right, click More  > Cast. 3. Choose the Chromecast device where you want to watch the content.”); https://support.google.com/chromecast/answer/3265953?hl=en-GB&ref_topic=4602553. Examples of this functionality are illustrated in the following screenshots from a Chromecast-enabled computing device running at least the YouTube Music, Google Play Music, and YouTube apps:</p>

Claim: 13	Chromecast-Enabled Computing Devices
	<div> </div> <p>Likewise, each Hub media player comprises instructions that, when executed by a Hub media player's processor, cause its graphical interface to display a selectable option for transferring playback from the Hub media player to another Chromecast-enabled media player.</p> <p>For instance, each Hub media player is programmed with the capability to cause its graphical interface to display a selectable option (e.g., a selectable "Cast button") for transferring playback of multimedia content from the Hub media player to another device (e.g., a Chromecast-enabled media player). <i>See, e.g.,</i> https://support.google.com/googlenest/answer/9563059?hl=en-GB&ref_topic=7030084 ("At the bottom-left corner of the screen, tap Devices  to see the list of available devices and speaker groups. . . . Select the device for which you want to move your media.""). Examples of this functionality are illustrated in the following screenshots from a Hub media player running at least the YouTube Music, Google Play Music, and YouTube apps:</p> <div> </div>

Claim: 13	Chromecast-Enabled Computing Devices
	
<p>detecting a set of inputs to transfer playback from the control device to a particular playback device, wherein the set of inputs comprises: (i) a selection of the selectable option for transferring playback from the control device and (ii) a selection of the particular playback device from the identified playback devices connected to the local area network:</p>	<p>Each Chromecast-enabled computing device comprises instructions that, when executed by a Chromecast-enabled computing device's processor, cause that Chromecast-enabled computing device to detect a set of inputs to transfer playback from the Chromecast-enabled computing device to a particular Chromecast-enabled media player, where the set of inputs comprises: (i) a selection of the selectable option for transferring playback from the Chromecast-enabled computing device and (ii) a selection of the particular Chromecast-enabled media player from the identified Chromecast-enabled media players connected to the LAN.</p> <p>For instance, each Chromecast-enabled computing device is programmed with the capability to (i) detect a selection of a displayed selectable option (e.g., a selectable "Cast button") for transferring playback of multimedia content from the Chromecast-enabled computing device to another device, which triggers the Chromecast-enabled computing device to display a list of available devices for transferring playback that includes one or more identified Chromecast-enabled media players on the same LAN, and then (ii) detect a selection of at least one particular Chromecast-enabled media player connected to the same LAN. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084 ("Tap the Cast button . . . Tap the speaker or display for which you'd like to cast."); https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en ("Tap the Cast button . . . Select your Chromecast device from the device list."); https://support.google.com/chromecast/answer/2995235?hl=en-AU ("Tap the Cast button . . . Tap the Chromecast device to which you want to cast."); https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1 ("2. At the top right, click More  > Cast. 3. Choose the Chromecast device where you want to watch the content."); https://support.google.com/chromecast/answer/3265953?hl=en-GB&ref_topic=4602553. Examples of this functionality are illustrated in the following screenshots from a Chromecast-enabled</p>

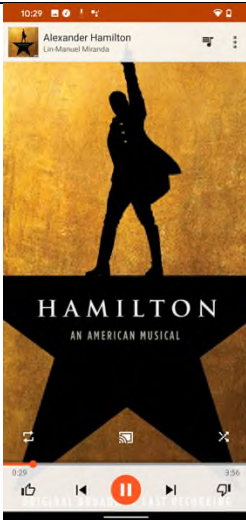
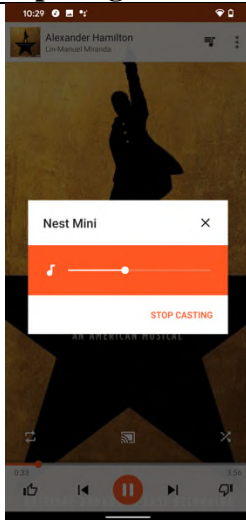
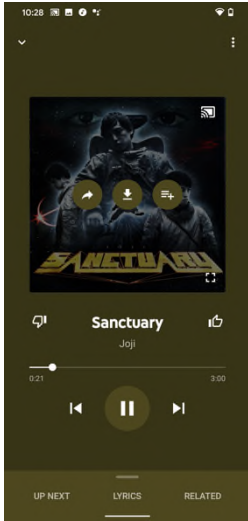
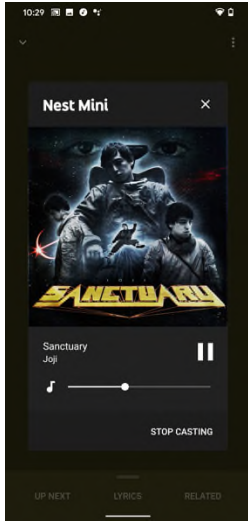

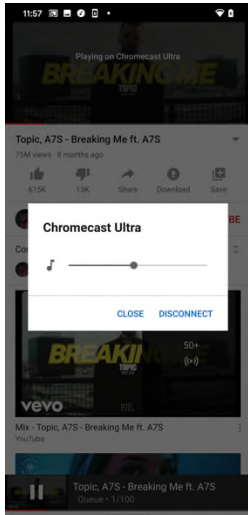
Claim: 13	Chromecast-Enabled Computing Devices
	<p>computing device running at least the YouTube Music, Google Play Music, and YouTube apps:</p> 

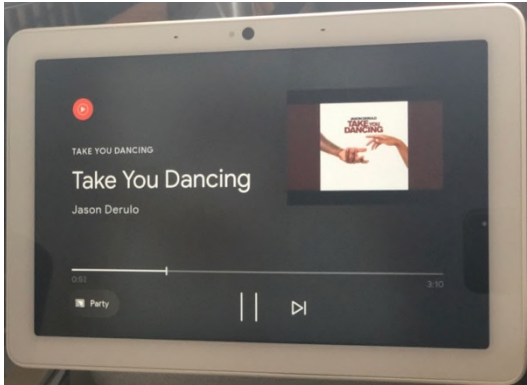
Claim: 13	Chromecast-Enabled Computing Devices
	<p>Likewise each Hub media player comprises instructions that, when executed by a Hub media player's processor, cause that Hub media player to detect a set of inputs to transfer playback from the Hub media player to a particular Chromecast-enabled media player, where the set of inputs comprises: (i) a selection of the selectable option for transferring playback from the Hub media player and (ii) a selection of the particular Chromecast-enabled media player from the identified Chromecast-enabled media players connected to the LAN.</p> <p>For instance, each Hub media player is programmed with the capability to (i) detect a selection of a displayed selectable option (e.g., a selectable "Cast button") for transferring playback of multimedia content from the Hub media player to another device, which triggers the Hub media player to display a list of available devices for transferring playback that includes one or more identified Chromecast-enabled media players on the same LAN, and then (ii) detect a selection of at least one particular Chromecast-enabled media player connected to the same LAN. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/9563059?hl=en-GB&ref_topic=7030084 ("At the bottom-left corner of the screen, tap Devices  to see the list of available devices and speaker groups. . . . Select the device for which you want to move your media.""). Examples of this functionality are illustrated in the following screenshots from a Hub media player running at least the YouTube Music, Google Play Music, and YouTube apps:</p> <div>  </div>

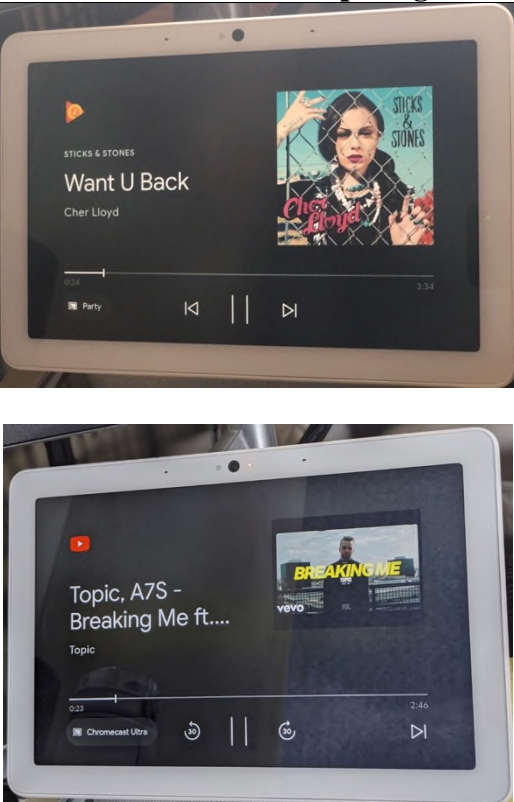
Claim: 13	Chromecast-Enabled Computing Devices
	
<p>after detecting the set of inputs to transfer playback from the control device to the particular playback device, causing playback to be transferred from the control device to the particular playback device,</p>	<p>Each Chromecast-enabled computing device comprises instructions that, when executed by a Chromecast-enabled computing device's processor, cause that Chromecast-enabled computing device to, after detecting the set of inputs to transfer playback from the Chromecast-enabled computing device to the particular Chromecast-enabled media player, cause playback to be transferred from the Chromecast-enabled computing device to the particular Chromecast-enabled media player.</p> <p>For instance, each Chromecast-enabled computing device is programmed such that, after detecting a set of inputs to transfer the Chromecast-enabled computing device's playback of multimedia content to at least one particular Chromecast-enabled media player, the Chromecast-enabled computing device causes the playback of the multimedia content to be transferred to the at least one particular Chromecast-enabled media player. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084 ("When you're connected, the Cast button will turn from light to dark grey, letting you know that you're connected."); https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1 ("To the right of the address bar, next to your extensions, you'll see Active cast .</p> <p>https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en; https://support.google.com/chromecast/answer/2995235?hl=en-AU; https://support.google.com/chromecast/answer/3265953?hl=en-GB&ref_topic=4602553.</p> <p>Likewise, each Hub media player comprises instructions that, when executed by a Hub media player's processor, cause that Hub media player to, after detecting the set of inputs to transfer playback from the Hub media player to the particular Chromecast-enabled media player, cause playback to be transferred from the Hub media player to the particular Chromecast-enabled media player.</p>

Claim: 13	Chromecast-Enabled Computing Devices
	<p>For instance, each Hub media player is programmed such that, after detecting a set of inputs to transfer the Hub media player's playback of multimedia content to at least one particular Chromecast-enabled media player, the Hub media player causes the playback of the multimedia content to be transferred to the at least one particular Chromecast-enabled media player. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/9563059?hl=en-GB&ref_topic=7030084.</p>
<p>wherein transferring playback from the control device to the particular playback device comprises: (a) causing one or more first cloud servers to add multimedia content to a local playback queue on the particular playback device, wherein adding the multimedia content to the local playback queue comprises the one or more first cloud servers adding, to the local playback queue, one or more resource locators corresponding to respective locations of the multimedia content at one or more second cloud servers of a streaming content service; (b) causing playback at the control device to be stopped; and (c) modifying the one or more transport controls of the control interface to control playback by</p>	<p>Each Chromecast-enabled computing device and each Hub media player is programmed such that transferring playback to the particular Chromecast-enabled media player comprises: (a) causing one or more first cloud servers to add multimedia content to a local playback queue on the particular Chromecast-enabled media player, where adding the multimedia content to the local playback queue comprises the one or more first cloud servers adding, to the local playback queue, one or more resource locators corresponding to respective locations of the multimedia content at one or more second cloud servers of a streaming content service, (b) causing playback at the Chromecast-enabled computing device (or Hub media player) to be stopped, and (c) modifying the one or more transport controls of the control interface to control playback by the Chromecast-enabled media player.</p> <p>For instance, on information and belief, each Chromecast-enabled computing device and each Hub media player is programmed such that, after detecting a set of inputs to transfer playback of multimedia content from a streaming content service (e.g., Google Play Music, YouTube Music, YouTube, etc.) to at least one particular Chromecast-enabled media player, the respective control device functions to (a) cause a first cloud server associated with the streaming content service (e.g., a first Google cloud server) to add resource locators for such multimedia content to a local playback queue of the particular Chromecast-enabled media player, where the resource locators correspond to locations of the multimedia content at a second cloud server associated with the streaming content service (e.g., a second Google cloud server), (b) stop its own playback of the multimedia content from the streaming content service, and (c) modify one or more transport controls of its control interface such that the one or more transport controls function to control playback by the at least one particular Chromecast-enabled media player rather than playback by the Chromecast-enabled computing device. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084; https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en; https://support.google.com/chromecast/answer/2995235?hl=en-AU;</p>

Claim: 13	Chromecast-Enabled Computing Devices
the playback device; and	https://support.google.com/googlenest/answer/9563059?hl=en-GB&ref_topic=7030084 ; https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1 .
causing the particular playback device to play back the multimedia content, wherein the particular playback device playing back the multimedia content comprises the particular playback device retrieving the multimedia content from one or more second cloud servers of a streaming content service and playing back the retrieved multimedia content.	<p>Each Chromecast-enabled computing device comprises instructions that, when executed by a Chromecast-enabled computing device's processor, cause the particular Chromecast-enabled media player to play back the multimedia content, where the particular Chromecast-enabled media player playing back the multimedia content comprises the particular Chromecast-enabled media player retrieving the multimedia content from one or more second cloud servers of a streaming content service and playing back the retrieved multimedia content.</p> <p>For instance, on information and belief, each Chromecast-enabled computing device is programmed such that, after causing the Chromecast-enabled computing device's playback of multimedia content from a streaming content service (e.g., Google Play Music, YouTube Music, YouTube, etc.) to be transferred to at least one particular Chromecast-enabled media player, the Chromecast-enabled computing device causes the at least one particular Chromecast-enabled media player to play back the multimedia content from the streaming content service, which involves the particular Chromecast-enabled media player retrieving the multimedia content from the second cloud server associated with the streaming music service (e.g., the Google cloud server) and then playing back the retrieved multimedia content. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084; https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en; https://support.google.com/chromecast/answer/2995235?hl=en-AU; https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1; https://support.google.com/chromecast/answer/3265953?hl=en-GB&ref_topic=4602553. Examples of this functionality are illustrated in the following screenshots from a Chromecast-enabled computing device running at least the YouTube Music, Google Play Music, and YouTube apps:</p>

Claim: 13	Chromecast-Enabled Computing Devices
	     

Claim: 13	Chromecast-Enabled Computing Devices
	<p>Likewise each Hub media player comprises instructions that, when executed by a Hub media player's processor, cause the particular Chromecast-enabled media player to play back the multimedia content, where the particular Chromecast-enabled media player playing back the multimedia content comprises the particular Chromecast-enabled media player retrieving the multimedia content from one or more second cloud servers of a streaming content service and playing back the retrieved multimedia content.</p> <p>For instance, on information and belief, each Hub media player is programmed such that, after causing the Hub media player's playback of multimedia content from a streaming content service (e.g., Google Play Music, YouTube Music, YouTube, etc.) to be transferred to at least one particular Chromecast-enabled media player, the Hub media player causes the at least one particular Chromecast-enabled media player to play back the multimedia content from the streaming content service, which involves the particular Chromecast-enabled media player retrieving the multimedia content from the second cloud server associated with the streaming music service (e.g., the second Google cloud server) and then playing back the retrieved multimedia content. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/9563059?hl=en-GB&ref_topic=7030084. Examples of this functionality are illustrated in the following screenshots from a Hub media player running at least the YouTube Music, Google Play Music, and YouTube apps:</p> 

Claim: 13	Chromecast-Enabled Computing Devices
	

83. On September 28, 2020, Sonos provided Google with a draft of this complaint prior to its filing. That draft identified the '615 Patent and described how Google's products infringed. Thus, Google had actual knowledge of Sonos's allegation that Google infringed claims of the '615 Patent prior to Sonos filing the complaint in this action.

84. Additionally and/or alternatively, Google has indirectly infringed and continues to indirectly infringe one or more of the claims of the '615 Patent, in violation of 35 U.S.C. § 271(b), by actively inducing users of the Google Wireless Audio System to directly infringe the one or more claims of the '615 Patent. In particular, (a) Google had actual knowledge of the '615 Patent or was willfully blind to its existence prior to, and no later than, February 2019 and had actual knowledge or was willfully blind to Sonos's infringement allegations at least as early as September 28, 2020 when Sonos provided Google a copy of the complaint (*see* ¶¶ 19-29, above), (b) Google intentionally causes, urges, or encourages users of the Google Wireless Audio System to directly infringe one or more claims of the '615 Patent by promoting, advertising, and

instructing customers and potential customers about the Google Wireless Audio System (including uses thereof) and encouraging such customers and potential customers to engage in activity that constitutes direct infringement (*see* Exs. 22-27; *see also* citations above in the exemplary infringement claim chart for claim 13 of the '615 Patent), (c) Google knows (or should know) that its actions will induce users of the Google Wireless Audio System to directly infringe one or more claims of the '615 Patent, and (d) users of the Google Wireless Audio System directly infringe one or more claims of the '615 Patent. For instance, at a minimum, Google has supplied and continues to supply the YouTube Music, Google Play Music, and YouTube apps to customers while knowing that installation and/or use of one or more of these apps will infringe one or more claims of the '615 Patent, and that Google's customers then directly infringe one or more claims of the '615 Patent by installing and/or using one or more of these apps in accordance with Google's product literature. *See, e.g., id.*

85. Additionally and/or alternatively, Google has indirectly infringed and continues to indirectly infringe one or more of the claims of the '615 Patent, in violation of 35 U.S.C. § 271(c), by offering to sell or selling within the United States, and/or importing into the United States, components in connection with the Google Wireless Audio System that contribute to the direct infringement of the '615 Patent by users of the Google Wireless Audio System. In particular, (a) Google had actual knowledge of the '615 Patent or was willfully blind to its existence prior to, and no later than, February 2019 and had actual knowledge or was willfully blind to Sonos's infringement allegations at least as early as September 28, 2020 when Sonos provided Google a copy of the complaint (*see* ¶¶ 19-29 above), (b) Google offers for sale, sells, and/or imports, in connection with the Google Wireless Audio System, one or more material components of the invention of the '615 Patent that are not staple articles of commerce suitable for substantial noninfringing use, (c) Google knows (or should know) that such component(s) were especially made or especially adapted for use in an infringement of the '615 Patent, and (d) users of devices that comprise such material component(s) directly infringe one or more claims of the '615 Patent. For instance, at a minimum, Google offers for sale, sells, and/or imports the YouTube Music,

Google Play Music, and YouTube apps for installation on devices (*e.g.*, smartphones, tablets, and computers) that meet one or more claims of the '615 Patent. *See, e.g.*, Exs. 22-27. These apps are a material component of the devices that meet the one or more claims of the '615 Patent. Further, Google especially made and/or adapted these apps for installation and use on devices that meet the one or more claims of the '615 Patent, and these apps are not a staple article of commerce suitable for substantial noninfringing use. Google's customers then directly infringe the one or more claims of the '615 Patent by installing and/or using these apps on the customers' devices.

86. Google's infringement of the '615 Patent is also willful because Google (a) had actual knowledge of the '615 Patent no later than February 2019 and actual notice of Sonos's infringement contentions no later than September 28, 2020 (*see* ¶¶ 19-29 above), (b) engaged in the aforementioned activity despite an objectively high likelihood that Google's actions constituted infringement of the '615 Patent, and (c) this objectively-defined risk was either known or so obvious that it should have been known to Google.

87. Additional allegations regarding Google's pre-suit knowledge of the '615 Patent and willful infringement will likely have evidentiary support after a reasonable opportunity for discovery.

88. Sonos is entitled to recover from Google all damages that Sonos has sustained as a result of Google's infringement of the '615 Patent, including, without limitation, a reasonable royalty and lost profits.

89. Google's infringement of the '615 Patent was and continues to be willful and deliberate, entitling Sonos to enhanced damages.

90. Google's infringement of the '615 Patent is exceptional and entitles Sonos to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

91. Google's infringement of the '615 Patent has caused irreparable harm (including the loss of market share) to Sonos and will continue to do so unless enjoined by this Court.

COUNT II: INFRINGEMENT OF U.S. PATENT NO. 10,779,033

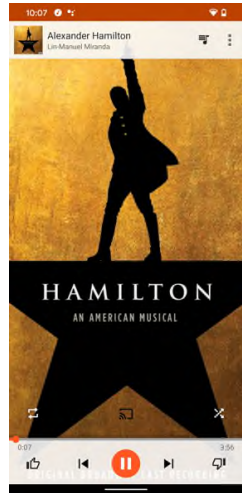
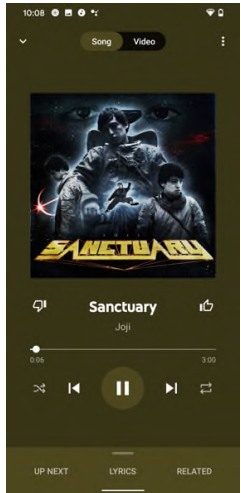
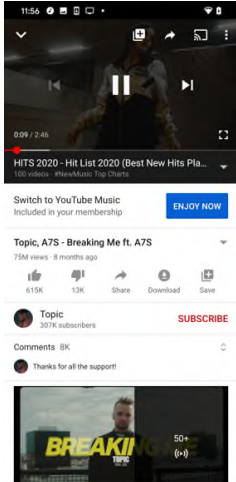
92. Sonos incorporates by reference and re-alleges paragraphs 1-79 of this Complaint as if fully set forth herein.

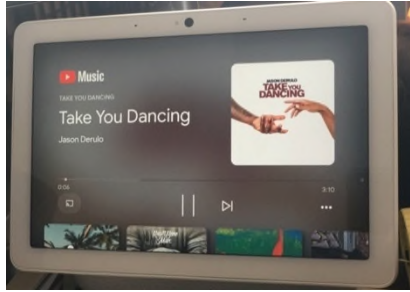
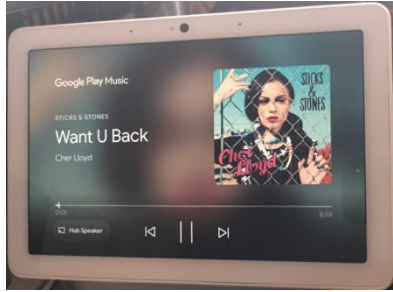

93. Google and/or users of the Google Wireless Audio System have directly infringed (either literally or under the doctrine of equivalents) and continue to directly infringe one or more of the claims of the '033 Patent, in violation of 35 U.S.C. § 271(a), by making, using, offering for sale, and/or selling the Google Wireless Audio System within the United States and/or importing the Google Wireless Audio System into the United States without authority or license.





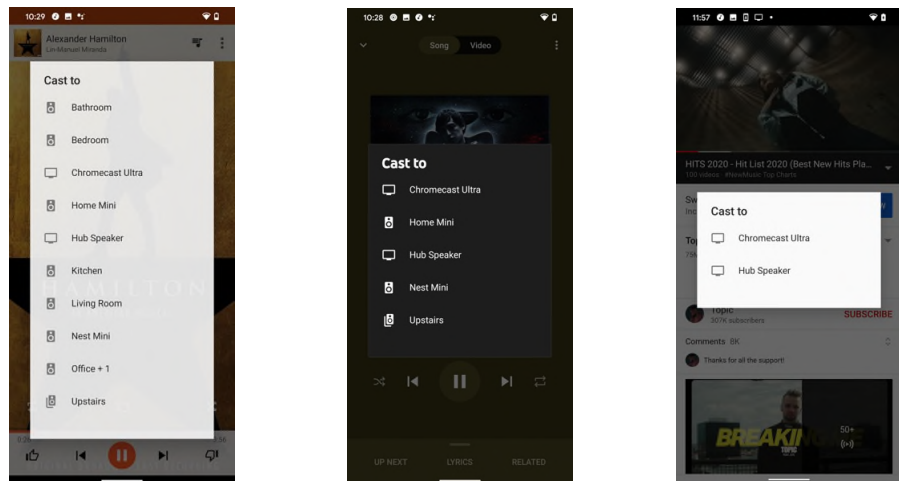
94. As just one non-limiting example, set forth below is an exemplary infringement claim chart for claim 1 of the '033 Patent in connection with the Google Wireless Audio System. This claim chart is based on publicly available information. Sonos reserves the right to modify this claim chart, including, for example, on the basis of information about the Google Wireless Audio System that it obtains during discovery.



Claim: 1	Chromecast-Enabled Computing Devices
A computing device comprising:	At least each smartphone, tablet, and computer running the YouTube Music app, the Google Play Music app, the YouTube app, and/or other native or web-based Chromecast-enabled apps (where a computing device installed with at least one of these Chromecast-enabled apps is referred to herein as a “Chromecast-enabled computing device”) comprises a “computing device,” as recited in claim 1. At least each Home Mini, Nest Mini, Home, Home Max, Home Hub, Nest Hub, Nest Hub Max, Nest Wifi Point, Chromecast, Chromecast Audio, Chromecast Ultra, Chromecast with Google TV, and Nest Audio (“Chromecast-enabled media player”) is a data network device configured to process and output audio, and thus, comprises a “playback device” as recited in claim 13. <i>See, e.g.,</i> https://store.google.com/us/magazine/compare_pixel ; https://store.google.com/us/product/google_pixelbook_specs ; https://store.google.com/us/product/pixel_slate_specs ; https://store.google.com/us/product/google_home_max?hl=en-US ; https://store.google.com/us/product/google_home_max_partners?hl=en-US ; https://store.google.com/product/chromecast_apps?utm_source=chromecast.com .

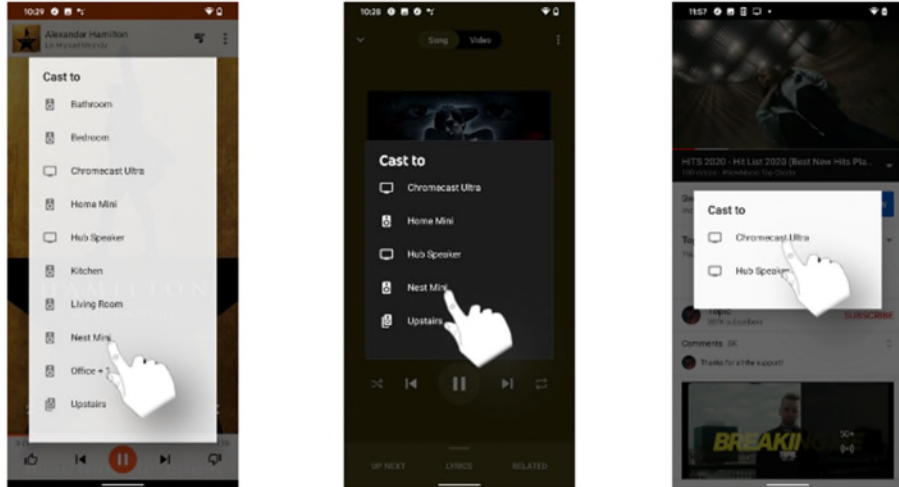
Claim: 1	Chromecast-Enabled Computing Devices
	<p>In addition to being a “playback device” as recited in claim 1, each Home Hub, Nest Hub, and Nest Hub Max (referred to herein as a “Hub media player”) is installed with Home/Nest Hub controller software such that the given Hub media player also comprises a “computing device,” as recited in claim 1. <i>See, e.g.,</i> https://store.google.com/us/product/google_nest_hub?hl=en-US#overview-modal-music; https://store.google.com/us/product/google_nest_hub_max?hl=en-US; https://support.google.com/googlenest/answer/9165738?hl=en-GB&ref_topic=7030084.</p>
at least one processor;	<p>Each Chromecast-enabled computing device and each Hub media player includes at least one processor. <i>See, e.g.,</i> https://store.google.com/us/magazine/compare_pixel; https://store.google.com/us/product/google_pixelbook_specs; https://store.google.com/us/product/pixel_slate_specs; https://store.google.com/us/product/google_home_max?hl=en-US.</p>
a non-transitory computer-readable medium; and	<p>Each Chromecast-enabled computing device and each Hub media player includes a non-transitory computer-readable medium. <i>See, e.g.,</i> https://store.google.com/us/magazine/compare_pixel; https://store.google.com/us/product/google_pixelbook_specs; https://store.google.com/us/product/pixel_slate_specs; https://store.google.com/us/product/google_home_max?hl=en-US.</p>
program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the computing device to perform functions comprising:	<p>Each Chromecast-enabled computing device and each Hub media player includes program instructions stored on the non-transitory computer-readable medium that enable the respective device to perform the functions identified below. <i>See, e.g.,</i> https://store.google.com/us/magazine/compare_pixel; https://store.google.com/us/product/google_pixelbook_specs; https://store.google.com/us/product/pixel_slate_specs; https://store.google.com/us/product/google_home_max?hl=en-US.</p>
operating in a first mode in which the computing device is configured for playback of a remote playback queue provided by a cloud-based computing system associated with a cloud-based media service;	<p>Each Chromecast-enabled computing device comprises instructions that, when executed by a Chromecast-enabled computing device’s processor, cause the Chromecast-enabled computing device to operate in a first mode in which the Chromecast-enabled computing device is configured for playback of a remote playback queue provided by a cloud-based computing system associated with a cloud-based media service.</p> <p>For instance, each Chromecast-enabled computing device is programmed with the capability to operate in a mode in which the Chromecast-enabled computing device is configured for playback of a remote playback queue provided by a Google cloud server associated with a cloud-based media service (e.g., Google Play Music, YouTube</p>

Claim: 1	Chromecast-Enabled Computing Devices
	<p>Music, YouTube, etc.). <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084; https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en; https://support.google.com/chromecast/answer/2995235?hl=en-AU; https://support.google.com/googlenest/answer/9563059?hl=en-GB&ref_topic=7030084; https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1; https://support.google.com/chromecast/answer/3265953?hl=en-GB&ref_topic=4602553. Examples of this functionality are illustrated in the following screenshots from a Chromecast-enabled computing device running at least the YouTube Music, Google Play Music, and YouTube apps:</p> <div>  </div> <div>  </div> <div>  </div> <p>Likewise, each Hub media player comprises instructions that, when executed by a Hub media player's processor, cause the Hub media player to operate in a first mode in which the Hub media player is configured for playback of a remote playback queue provided by a cloud-based computing system associated with a cloud-based media service.</p> <p>For instance, each Hub media player is programmed with the capability to operate in a mode in which the Hub media player is configured for playback of a remote playback queue provided by a Google cloud server associated with a cloud-based media service (e.g., Google Play Music, YouTube Music, YouTube, etc.). <i>See, e.g.,</i> https://store.google.com/us/product/google_nest_hub?hl=en-US#overview-modal-music ("YouTube Music on demand. . . . Stream top music services.");</p>

Claim: 1	Chromecast-Enabled Computing Devices
	<p>https://store.google.com/us/product/google_nest_hub_max?hl=en-US (“jam out with YouTube Music.”); https://support.google.com/googlenest/answer/9165738?hl=en-GB&ref_topic=7030084 (“With YouTube built-in to your Google Nest display, you can watch YouTube Originals, how-to videos and much more, seamlessly on your screen.”). Examples of this functionality are illustrated in the following screenshots from a Hub media player running at least the YouTube Music, Google Play Music, and YouTube apps:</p> <div>  </div> <div>  </div> <div>  </div>
<p>while operating in the first mode, displaying a representation of one or more playback devices in a media playback system that are each i) communicatively coupled to the computing device over a data network and ii) available to accept playback responsibility for the remote playback queue;</p>	<p>Each Chromecast-enabled computing device comprises instructions that, when executed by a Chromecast-enabled computing device’s processor, cause the Chromecast-enabled computing device to, while operating in the first mode, display a representation of one or more Chromecast-enabled media players in a Chromecast-enabled playback system that are each (i) communicatively coupled to the Chromecast-enabled computing device over a data network and (ii) available to accept playback responsibility for the remote playback queue.</p> <p>For instance, each Chromecast-enabled computing device is programmed such that, while operating in a mode in which the Chromecast-enabled computing device is configured for playback of a remote playback queue provided by a Google cloud server associated with a cloud-based media service (e.g., Google Play Music, YouTube Music, YouTube, etc.), the Chromecast-enabled computing device is operable to detect a selection of a displayed selectable option (e.g., a selectable “Cast button”) for transferring playback of multimedia content from the Chromecast-enabled computing device to another</p>

Claim: 1	Chromecast-Enabled Computing Devices
	<p>device, which triggers the Chromecast-enabled computing device to display a list of available devices for transferring playback that includes one or more Chromecast-enabled media players in a Chromecast-enabled playback system that are each (i) communicatively coupled to the Chromecast-enabled computing device over a local area network (“LAN”) and (ii) available to accept playback responsibility for the remote playback queue. <i>See, e.g.</i>, https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084 (“Tap the Cast button . . . Tap the speaker or display for which you'd like to cast.”); https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en (“Tap the Cast button . . . Select your Chromecast device from the device list.”); https://support.google.com/chromecast/answer/2995235?hl=en-AU (“Tap the Cast button . . . Tap the Chromecast device to which you want to cast.”); https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1 (“2. At the top right, click More  > Cast. 3. Choose the Chromecast device where you want to watch the content.”); https://support.google.com/chromecast/answer/3265953?hl=en-GB&ref_topic=4602553. Examples of this functionality are illustrated in the following screenshots from a Chromecast-enabled computing device running at least the YouTube Music, Google Play Music, and YouTube apps:</p> <div>  </div> <p>Likewise, each Hub media player comprises instructions that, when executed by a Hub media player’s processor, cause the Hub media player to, while operating in the first mode, display a representation of one or more Chromecast-enabled media players in a Chromecast-enabled playback system that are each (i) communicatively coupled to</p>


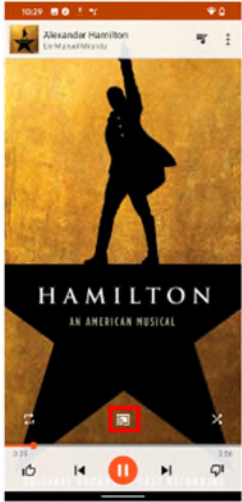
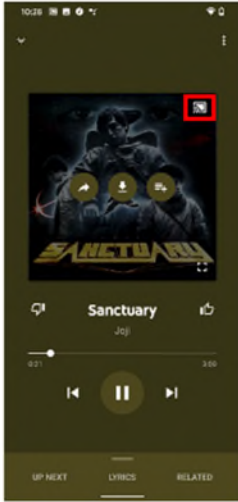

Claim: 1	Chromecast-Enabled Computing Devices
	<p>the Hub media player over a data network and (ii) available to accept playback responsibility for the remote playback queue.</p> <p>For instance, each Hub media player is programmed such that, while operating in a mode in which the Hub media player is configured for playback of a remote playback queue provided by a Google cloud-based computing system associated with a cloud-based media service (e.g., Google Play Music, YouTube Music, YouTube, etc.), the Hub media player is operable to detect a selection of a displayed selectable option (e.g., a selectable “Cast button”) for transferring playback of multimedia content from the Hub media player to another device, which triggers the Hub media player to display a list of available devices for transferring playback that includes one or more other Chromecast-enabled media players in a Chromecast-enabled playback system that are each (i) communicatively coupled to the Hub media player over a LAN and (ii) available to accept playback responsibility for the remote playback queue. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/9563059?hl=en-GB&ref_topic=7030084 (“At the bottom-left corner of the screen, tap Devices  to see the list of available devices and speaker groups. . . . Select the device for which you want to move your media.”). Examples of this functionality are illustrated in the following screenshots from a Hub media player running at least the YouTube Music, Google Play Music, and YouTube apps:</p> <div>  </div>
while displaying the representation of the one or more playback devices, receiving	Each Chromecast-enabled computing device comprises instructions that, when executed by a Chromecast-enabled computing device’s processor, cause the Chromecast-enabled computing device to, while displaying the representation of the one or more Chromecast-enabled

Claim: 1	Chromecast-Enabled Computing Devices
<p>user input indicating a selection of at least one given playback device from the one or more playback devices;</p>	<p>media players, receive user input indicating a selection of at least one given Chromecast-enabled media player from the one or more Chromecast-enabled media players.</p> <p>For instance, each Chromecast-enabled computing device is programmed such that, while displaying the representation of the one or more Chromecast-enabled media players in a Chromecast-enabled playback system that are each on the same LAN as the Chromecast-enabled computing device and available to accept playback responsibility for the remote playback queue, the Chromecast-enabled computing device is configured to receive user input indicating a selection of at least one Chromecast-enabled media player in the Chromecast-enabled playback system. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084 (“Tap the speaker or display for which you'd like to cast.”); https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en (“Select your Chromecast device from the device list.”); https://support.google.com/chromecast/answer/2995235?hl=en-AU (“Tap the Chromecast device to which you want to cast.”); https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1 (“Choose the Chromecast device where you want to watch the content.”). Examples of this functionality are illustrated in the following screenshots from a Chromecast-enabled computing device running at least the YouTube Music, Google Play Music, and YouTube apps:</p> <div>  </div> <p>Likewise each Hub media player comprises instructions that, when executed by a Hub media player's processor, cause the Hub media</p>

Claim: 1	Chromecast-Enabled Computing Devices
	<p>player to, while displaying the representation of the one or more Chromecast-enabled media players, receive user input indicating a selection of at least one given Chromecast-enabled media player from the one or more Chromecast-enabled media players.</p> <p>For instance, each Hub media player is programmed such that, while displaying the representation of the one or more other Chromecast-enabled media players in a Chromecast-enabled playback system that are each on the same LAN as the Hub media player and available to accept playback responsibility for the remote playback queue, the Hub media player is configured to receive user input indicating a selection of at least one other Chromecast-enabled media player in the Chromecast-enabled playback system. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/9563059?hl=en-GB&ref_topic=7030084 (“Select the device for which you want to move your media.”). Examples of this functionality are illustrated in the following screenshots from a Hub media player:</p> <div> </div> <div> </div> <div> </div>
based on receiving the user input,	Each Chromecast-enabled computing device comprises instructions that, when executed by a Chromecast-enabled computing device's

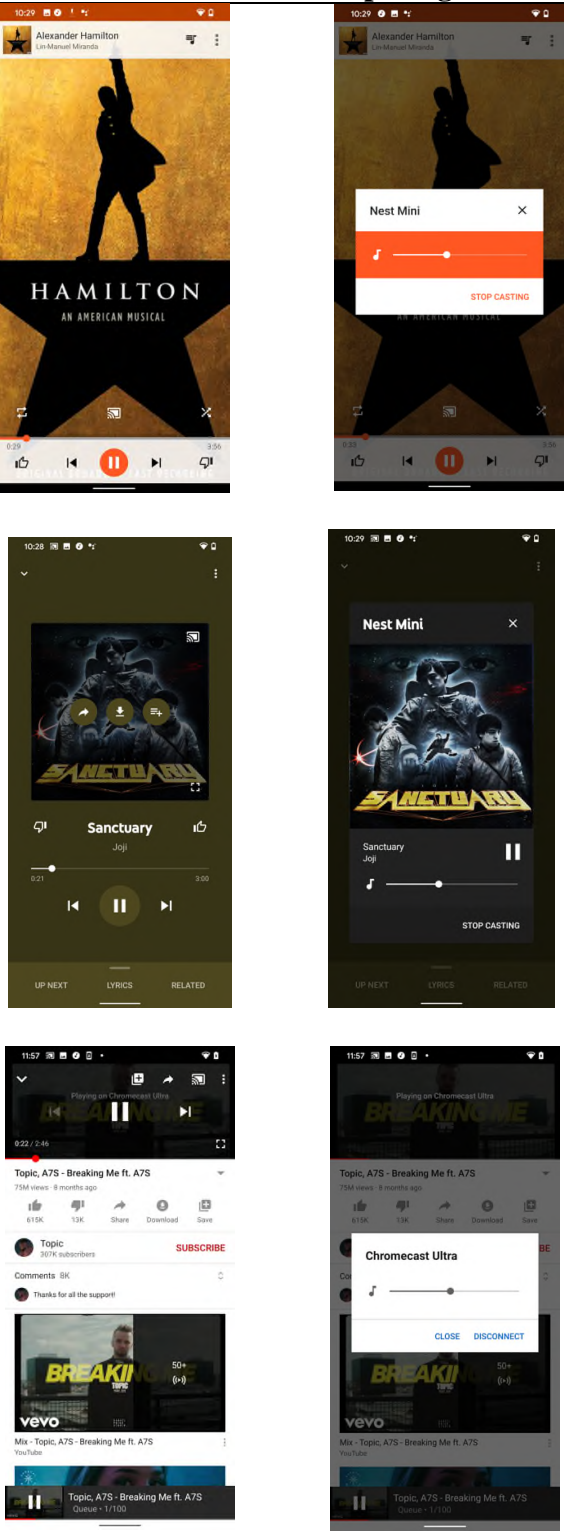
Claim: 1	Chromecast-Enabled Computing Devices
<p>transmitting an instruction for the at least one given playback device to take over responsibility for playback of the remote playback queue from the computing device, wherein the instruction configures the at least one given playback device to (i) communicate with the cloud-based computing system in order to obtain data identifying a next one or more media items that are in the remote playback queue, (ii) use the obtained data to retrieve at least one media item in the remote playback queue from the cloud-based media service; and (iii) play back the retrieved at least one media item;</p>	<p>processor, cause the Chromecast-enabled computing device to, based on receiving the user input, transmit an instruction for the at least one given Chromecast-enabled media player to take over responsibility for playback of the remote playback queue from the Chromecast-enabled computing device, wherein the instruction configures the at least one given Chromecast-enabled media player to (i) communicate with the Google cloud-based computing system in order to obtain data identifying a next one or more media items that are in the remote playback queue, (ii) use the obtained data to retrieve at least one media item in the remote playback queue from the Google cloud-based media service; and (iii) play back the retrieved at least one media item.</p> <p>For instance, on information and belief, each Chromecast-enabled computing device is programmed such that, based on receiving the user input indicating a selection of at least one Chromecast-enabled media player in the Chromecast-enabled playback system that is on the same LAN as the Chromecast-enabled computing device and available to accept playback responsibility for the remote playback queue, the Chromecast-enabled computing device is configured to transmit an instruction for the Chromecast-enabled media player to take over responsibility for playback of the remote playback queue from the Chromecast-enabled computing device, where the instruction configures the Chromecast-enabled media player to (i) communicate with a Google cloud server associated with a Google cloud-based media service (e.g., Google Play Music, YouTube Music, YouTube, etc.) in order to obtain data identifying a next one or more media items that are in the remote playback queue (e.g., resource locators for such media items), (ii) use the obtained data to retrieve at least one media item in the remote playback queue from the Google cloud-based media service; and (iii) play back the retrieved at least one media item. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084; https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en; https://support.google.com/chromecast/answer/2995235?hl=en-AU; https://support.google.com/googlenest/answer/9563059?hl=en-GB&ref_topic=7030084; https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1.</p> <p>Likewise each Hub media player comprises instructions that, when executed by a Hub media player's processor, cause the Hub media player to, based on receiving the user input, transmit an instruction for</p>

Claim: 1	Chromecast-Enabled Computing Devices
	<p>the at least one given Chromecast-enabled media player to take over responsibility for playback of the remote playback queue from the Hub media player, wherein the instruction configures the at least one given Chromecast-enabled media player to (i) communicate with the Google cloud-based computing system in order to obtain data identifying a next one or more media items that are in the remote playback queue, (ii) use the obtained data to retrieve at least one media item in the remote playback queue from the Google cloud-based media service; and (iii) play back the retrieved at least one media item.</p> <p>For instance, on information and belief, each Hub media player is programmed such that, based on receiving the user input indicating a selection of at least one other Chromecast-enabled media player in the Chromecast-enabled playback system that is on the same LAN as the Hub media player and available to accept playback responsibility for the remote playback queue, the Hub media player is configured to transmit an instruction for the other Chromecast-enabled media player to take over responsibility for playback of the remote playback queue from the Hub media player, where the instruction configures the other Chromecast-enabled media player to (i) communicate with a Google cloud server associated with a Google cloud-based media service (e.g., Google Play Music, YouTube Music, YouTube, etc.) in order to obtain data identifying a next one or more media items that are in the remote playback queue (e.g., resource locators for such media items), (ii) use the obtained data to retrieve at least one media item in the remote playback queue from the Google cloud-based media service; and (iii) play back the retrieved at least one media item. <i>See, e.g., id.</i></p>
<p>detecting an indication that playback responsibility for the remote playback queue has been successfully transferred from the computing device to the at least one given playback device; and</p>	<p>Each Chromecast-enabled computing device comprises instructions that, when executed by a Chromecast-enabled computing device's processor, cause the Chromecast-enabled computing device to detect an indication that playback responsibility for the remote playback queue has been successfully transferred from the Chromecast-enabled computing device to the at least one given Chromecast-enabled media player.</p> <p>For instance, each Chromecast-enabled computing device is programmed with the capability to detect an indication that playback responsibility for the remote playback queue has been successfully transferred from the Chromecast-enabled computing device to at least one Chromecast-enabled media player, which is demonstrated by the fact that the Chromecast-enabled computing device displays an indicator that playback responsibility for the remote playback queue has been successfully transferred to the at least one Chromecast-enabled media player that takes the form of a "Cast button" that is</p>

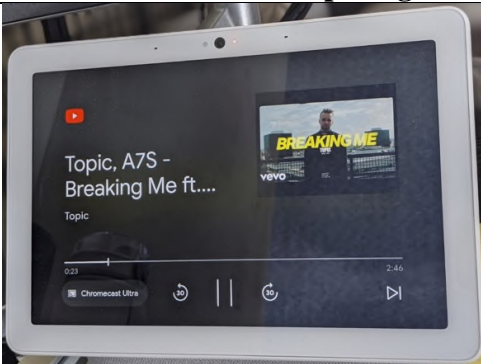
Claim: 1	Chromecast-Enabled Computing Devices
	<p>“filled in” and/or “dark grey.” See, e.g., https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084 (“When you're connected, the Cast button will turn from light to dark grey, letting you know that you're connected.”); https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1 (“To the right of the address bar, next to your extensions, you'll see Active cast .”); https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en; https://support.google.com/chromecast/answer/2995235?hl=en-AU; https://support.google.com/chromecast/answer/3265953?hl=en-GB&ref_topic=4602553. Examples of a Chromecast-enabled computing device detecting an indication that playback responsibility for the remote playback queue has been successfully transferred from the Chromecast-enabled computing device to at least one Chromecast-enabled media player are illustrated in the following screenshots from a Chromecast-enabled computing device running at least the YouTube Music, Google Play Music, and YouTube apps:</p> <div>  </div> <div>  </div> <div>  </div> <p>Likewise, each Hub media player comprises instructions that, when executed by a Hub media player's processor, cause the Hub media player to detect an indication that playback responsibility for the remote playback queue has been successfully transferred from the Hub media player to the at least one given Chromecast-enabled media player.</p> <p>For instance, each Hub media player is programmed with the capability to detect an indication that playback responsibility for the</p>

Claim: 1	Chromecast-Enabled Computing Devices
	<p>remote playback queue has been successfully transferred from the Hub media player to at least one other Chromecast-enabled media player, which is demonstrated by the fact that the Chromecast-enabled computing device displays an indicator that playback responsibility for the remote playback queue has been successfully transferred to the at least one other Chromecast-enabled media player that takes the form of a “Cast button” that is “filled in” and/or has a “dark grey” color along with a display of the other Chromecast-enabled media player’s name. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/9563059?hl=en-GB&ref_topic=7030084. Examples of a selectable “Cast button” having this second visual appearance are illustrated in the following screenshots from a Hub media player running at least the YouTube Music, Google Play Music, and YouTube apps:</p> <div> </div> <div> </div> <div> </div>
after detecting the indication,	Each Chromecast-enabled computing device comprises instructions that, when executed by a Chromecast-enabled computing device’s

Claim: 1	Chromecast-Enabled Computing Devices
<p>transitioning from i) the first mode in which the computing device is configured for playback of the remote playback queue to ii) a second mode in which the computing device is configured to control the at least one given playback device's playback of the remote playback queue and the computing device is no longer configured for playback of the remote playback queue.</p>	<p>processor, cause the Chromecast-enabled computing device to, after detecting the indication, transition from (i) the first mode in which the Chromecast-enabled computing device is configured for playback of the remote playback queue to (ii) a second mode in which the Chromecast-enabled computing device is configured to control the at least one given Chromecast audio player's playback of the remote playback queue and the Chromecast-enabled computing device is no longer configured for playback of the remote playback queue.</p> <p>For instance, each Chromecast-enabled computing device is programmed such that, after detecting the indication that playback responsibility for the remote playback queue has been successfully transferred from the Chromecast-enabled computing device to at least one Chromecast-enabled media player in the Chromecast-enabled playback system that is on the same LAN as the Chromecast-enabled computing device, the Chromecast-enabled computing device is configured to transition from (i) the first mode in which the Chromecast-enabled computing device was configured for playback of the remote playback queue to (ii) a second mode in which the Chromecast-enabled computing device is configured to control the at least one Chromecast-enabled media player's playback of the remote playback queue (while the Chromecast-enabled computing device itself is no longer configured for playback of the remote playback queue). <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084; https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en; https://support.google.com/chromecast/answer/2995235?hl=en-AU; https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1; https://support.google.com/chromecast/answer/3265953?hl=en-GB&ref_topic=4602553. Examples of a Chromecast-enabled computing device in this second mode are illustrated in the following screenshots from a Chromecast-enabled computing device running at least the YouTube Music, Google Play Music, and YouTube apps:</p>

Claim: 1	Chromecast-Enabled Computing Devices
	 <p>Each Hub media player comprises instructions that, when executed by a Hub media player's processor, cause the Hub media player to, after detecting the indication, transition from (i) the first mode in which the</p>

Claim: 1	Chromecast-Enabled Computing Devices
	<p>Hub media player is configured for playback of the remote playback queue to (ii) a second mode in which the Hub media player is configured to control the at least one given Chromecast audio player's playback of the remote playback queue and the Hub media player is no longer configured for playback of the remote playback queue.</p> <p>For instance, each Hub media player is programmed such that, after detecting the indication that playback responsibility for the remote playback queue has been successfully transferred from the Hub media player to at least one other Chromecast-enabled media player in the Chromecast-enabled playback system that is on the same LAN as the Hub media player, the Hub media player is configured to transition from (i) the first mode in which the Hub media player was configured for playback of the remote playback queue to (ii) a second mode in which the Hub media player is configured to control the at least one other Chromecast-enabled media player's playback of the remote playback queue (while the Hub media player itself is no longer configured for playback of the remote playback queue). <i>See, e.g.,</i> https://support.google.com/googlenest/answer/9563059?hl=en-GB&ref_topic=7030084. Examples of a Hub media player in this second mode are illustrated in the following screenshots from a Hub media player running at least the YouTube Music, Google Play Music, and YouTube apps:</p> <div> </div> <div> </div>

Claim: 1	Chromecast-Enabled Computing Devices
	

95. On September 28, 2020, Sonos provided Google with a draft of this complaint prior to its filing. That draft identified the '033 Patent and described how Google's products infringed. Thus, Google had actual knowledge of Sonos's allegation that Google infringed claims of the '033 Patent prior to Sonos filing the complaint in this action.

96. Additionally and/or alternatively, Google has indirectly infringed and continues to indirectly infringe one or more of the claims of the '033 Patent, in violation of 35 U.S.C. § 271(b), by actively inducing users of the Google Wireless Audio System to directly infringe the one or more claims of the '033 Patent. In particular, (a) Google had actual knowledge of the '033 Patent and Sonos's infringement contentions, or was willfully blind to their existence, no later than September 28, 2020 when Sonos provided Google with a copy of the complaint (*see* ¶¶ 19-29 above), (b) Google intentionally causes, urges, or encourages users of the Google Wireless Audio System to directly infringe one or more claims of the '033 Patent by promoting, advertising, and instructing customers and potential customers about the Google Wireless Audio System (including uses thereof) and encouraging such customers and potential customers to engage in activity that constitutes direct infringement (*see* Exs. 22-27; *see also* citations above in the exemplary infringement claim chart for claim 1 of the '033 Patent), (c) Google knows (or should know) that its actions will induce users of the Google Wireless Audio System to directly infringe one or more claims the '033 Patent, and (d) users of the Google Wireless Audio System directly infringe one or more claims of the '033 Patent. For instance, at a minimum, Google has supplied and continues to supply the YouTube Music, Google Play Music, and YouTube apps to customers

while knowing that installation and/or use of one or more of these apps will infringe one or more claims of the '033 Patent, and that Google's customers then directly infringe one or more claims of the '033 Patent by installing and/or using one or more of these apps in accordance with Google's product literature. *See, e.g., id.*

97. Additionally and/or alternatively, Google has indirectly infringed and continues to indirectly infringe one or more of the claims of the '033 Patent, in violation of 35 U.S.C. § 271(c), by offering to sell or selling within the United States, and/or importing into the United States, components in connection with the Google Wireless Audio System that contribute to the direct infringement of the '033 Patent by users of the Google Wireless Audio System. In particular, (a) Google had actual knowledge of the '033 Patent and Sonos's infringement contentions, or was willfully blind to their existence, no later than September 28, 2020 when Sonos provided Google with a copy of the complaint (*see* ¶¶ 19-29 above), (b) Google offers for sale, sells, and/or imports, in connection with the Google Wireless Audio System, one or more material components of the invention of the '033 Patent that are not staple articles of commerce suitable for substantial noninfringing use, (c) Google knows (or should know) that such component(s) were especially made or especially adapted for use in an infringement of the '033 Patent, and (d) users of devices that comprise such material component(s) directly infringe one or more claims of the '033 Patent. For instance, at a minimum, Google offers for sale, sells, and/or imports the YouTube Music, Google Play Music, and YouTube apps for installation on devices (*e.g.*, smartphones, tablets, and computers) that meet one or more claims of the '033 Patent. *See, e.g.*, Exs. 22-27. These apps are a material component of the devices that meet the one or more claims of the '033 Patent. Further, Google especially made and/or adapted these apps for installation and use on devices that meet the one or more claims of the '033 Patent, and these apps are not a staple article of commerce suitable for substantial noninfringing use. Google's customers then directly infringe the one or more claims of the '033 Patent by installing and/or using these apps on the customers' devices.

98. Google's infringement of the '033 Patent is also willful because Google (a) had actual knowledge of the '033 Patent and Sonos's infringement contentions no later than

September 28, 2020 (*see* ¶¶ 19-29 above), (b) engaged in the aforementioned activity despite an objectively high likelihood that Google's actions constituted infringement of the '033 Patent, and (c) this objectively-defined risk was either known or so obvious that it should have been known to Google.

99. Additional allegations regarding Google's pre-suit knowledge of the '033 Patent and willful infringement will likely have evidentiary support after a reasonable opportunity for discovery.

100. Sonos is entitled to recover from Google all damages that Sonos has sustained as a result of Google's infringement of the '033 Patent, including, without limitation, a reasonable royalty and lost profits.

101. Google's infringement of the '033 Patent was and continues to be willful and deliberate, entitling Sonos to enhanced damages.

102. Google's infringement of the '033 Patent is exceptional and entitles Sonos to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

103. Google's infringement of the '033 Patent has caused irreparable harm (including the loss of market share) to Sonos and will continue to do so unless enjoined by this Court.

COUNT III: INFRINGEMENT OF U.S. PATENT NO. 9,344,206

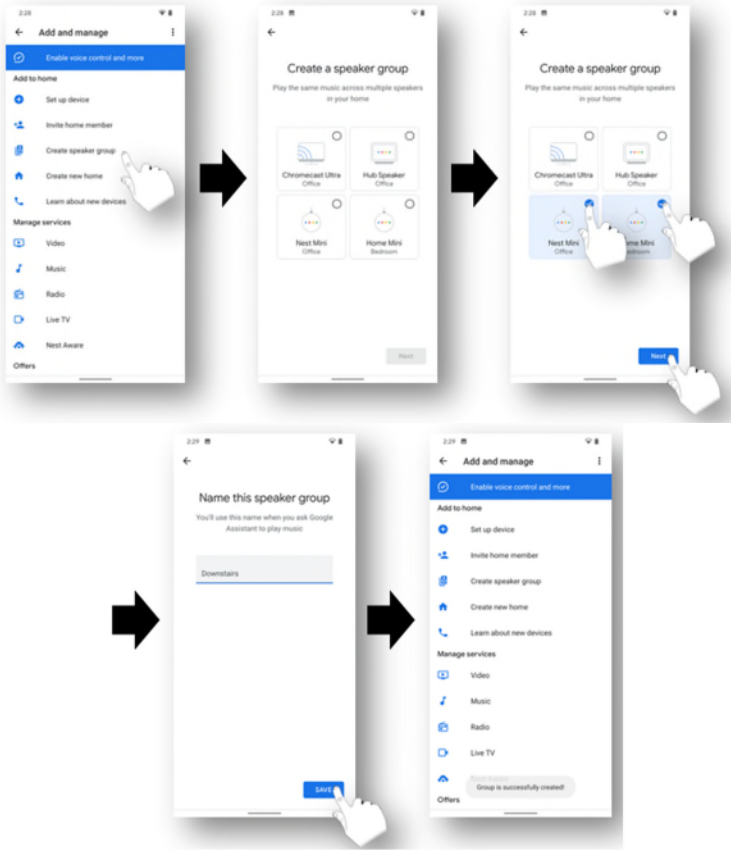
104. Sonos incorporates by reference and re-alleges paragraphs 1-79 of this Complaint as if fully set forth herein.

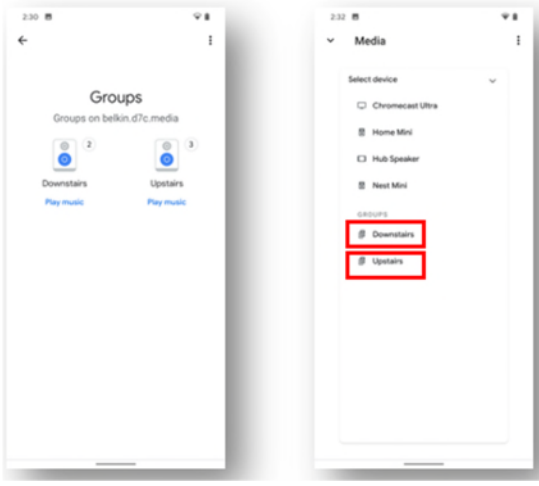
105. Google and/or users of the Google Wireless Audio System have directly infringed (either literally or under the doctrine of equivalents) and continue to directly infringe one or more of the claims of the '206 Patent, in violation of 35 U.S.C. § 271(a), by making, using, offering for sale, and/or selling the Google Wireless Audio System within the United States and/or importing the Google Wireless Audio System into the United States without authority or license.

106. As just one non-limiting example, set forth below is an exemplary infringement claim chart for claim 1 of the '206 Patent in connection with the Google Wireless Audio System. This claim chart is based on publicly available information. Sonos reserves the right to modify

this claim chart, including, for example, on the basis of information about the Google Wireless Audio System that it obtains during discovery.

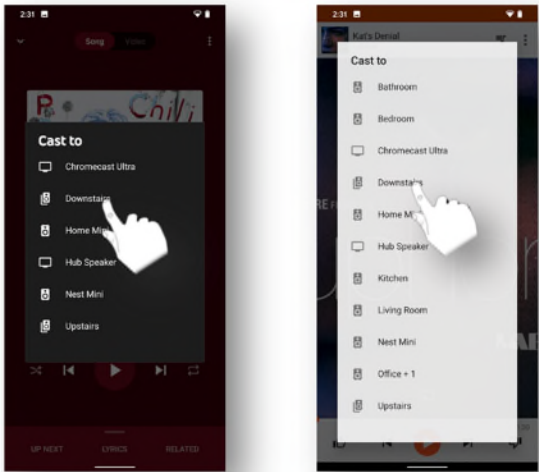
Claim: 1	Chromecast-Enabled Computing Devices
<p>A multimedia controller including a processor, the controller configured to:</p>	<p>At least each smartphone, tablet, and computer installed with at least the Google Home app (where a computing device installed with at least the Google Home app is referred to herein as a “Chromecast-enabled computing device”) comprises a “multimedia controller including a processor,” as recited in claim 1. At least each Home Mini, Nest Mini, Home, Home Max, Home Hub, Nest Hub, Nest Hub Max, Nest Wifi Point, Chromecast, Chromecast Audio, Chromecast Ultra, Chromecast with Google TV, and Nest Audio (“Chromecast-enabled media player”) is a data network device configured to process and output audio that is capable of playing multimedia separately from other Chromecast-enabled media players, and thus, comprises an “independent playback device” as recited in claim 1. <i>See, e.g.,</i> https://store.google.com/us/magazine/compare_pixel; https://store.google.com/us/product/google_pixelbook_specs; https://store.google.com/us/product/pixel_slate_specs; https://store.google.com/us/product/google_home_max?hl=en-US; https://store.google.com/us/product/google_home_max_partners?hl=en-US; https://play.google.com/store/apps/details?id=com.google.android.apps.chromecast.app&hl=en_US.</p> <p>In addition to being a “independent playback device” as recited in claim 1, each Home Hub, Nest Hub, and Nest Hub Max (referred to herein as a “Hub media player”) is installed with Home/Nest Hub controller software such that the given Hub media player also comprises a “multimedia controller including a processor,” as recited in claim 1. <i>See, e.g.,</i> https://store.google.com/us/product/google_nest_hub?hl=en-US#overview-modal-music; https://store.google.com/us/product/google_nest_hub_max?hl=en-US; https://support.google.com/googlenest/answer/9165738?hl=en-GB&ref_topic=7030084</p>
<p>receive, via a network interface, a zone configuration from a first independent playback device of a plurality of independent playback devices, wherein the zone</p>	<p>Each Chromecast-enabled computing device is configured to receive, via a network interface, a zone configuration from a first Chromecast-enabled media player of a plurality of Chromecast-enabled media players, where the zone configuration is configured via the Chromecast-enabled computing device, maintained at the first Chromecast-enabled media player, and characterizes one or more zone scenes that each identify a group configuration associated with two or more of the plurality of Chromecast-enabled media players.</p>

Claim: 1	Chromecast-Enabled Computing Devices
<p>configuration is configured via the controller and maintained at the first independent playback device, and wherein the zone configuration characterizes one or more zone scenes, each zone scene identifying a group configuration associated with two or more of the plurality of independent playback devices; and</p>	<p>For instance, each Chromecast-enabled computing device on a local area network (“LAN”) is configured to facilitate creation of predefined “speaker group” comprising two or more Chromecast-enabled media players on the same LAN as the Chromecast-enabled computing device, which is “a zone scene identifying a particular group configuration.” <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7174267?co=GENIE.Platform%3DAndroid&hl=en (providing instructions on how to create “speaker groups”). One example of this functionality is illustrated by the following screenshots, which shows the creation of a predefined “Downstairs” “speaker group” that identifies a particular group configuration comprising the “Nest Mini” and “Home Mini” players:</p>  <p>Once the predefined “speaker group” identifying the particular group configuration has been created, a zone configuration characterizing this “speaker group” is maintained at one or more of the plurality Chromecast-enabled media players on the same LAN as the Chromecast-enabled computing device (e.g., one or more of the Chromecast-enabled media players included in the predefined “speaker group”). <i>See, e.g., id.</i></p>

Claim: 1	Chromecast-Enabled Computing Devices
	<p>Thereafter, each Chromecast-enabled computing device and each Hub media player on the same LAN as the plurality of Chromecast-enabled media players is operable to receive the zone configuration characterizing the predefined “speaker group” from one or more of the plurality of Chromecast-enabled media players at various times – including in advance of a Chromecast-enabled computing device or Hub media player displaying the predefined “speaker group” as an available option for playback. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7174267?co=GENIE.Platform%3DAndroid&hl=en; https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en; https://support.google.com/googlenest/answer/7030379?co=GENIE.Platform%3DAndroid&hl=en-GB; https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084; https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1. Examples of this functionality are illustrated by the following screenshots from a Chromecast-enabled computing device installed with at least the Google Home, Google Play Music and YouTube Music apps, which show a Chromecast-enabled computing device that has received a zone configuration characterizing a “Downstairs” “speaker group” and a “Upstairs” “speaker group”:</p> 

Claim: 1	Chromecast-Enabled Computing Devices
	 <p>Notably, each Chromecast-enabled computing device and each Hub media player is programmed with the capability to display a predefined “speaker group” as an available option for playback regardless of whether the Chromecast-enabled computing device or Hub media player was used to create the predefined “speaker group” (and in fact, regardless of whether the Chromecast-enabled computing device or Hub media player was even powered up or on the same LAN as the plurality of Chromecast-enabled media players at the time that the “speaker group” was created), which demonstrates that each Chromecast-enabled computing device and each Hub media player receives a zone configuration characterizing a predefined “speaker group” from one or more of the Chromecast-enabled media players selected for inclusion in the “speaker group.” See e.g., https://support.google.com/googlenest/answer/7174267?co=GENIE.Platform%3DAndroid&hl=en.</p> <p>In this regard, to facilitate the above functionality, each Chromecast-enabled computing device and each Hub media player is programmed with the capability to receive, from one of the plurality of Chromecast-enabled media players, a zone configuration characterizing one or more zone scenes that each identify a respective group configuration comprising two or more of the plurality of Chromecast-enabled media players.</p>
cause a selectable indication of the received zone configuration to be displayed, wherein the displayed selectable indication is selectable to cause	<p>Each Chromecast-enabled computing device is configured to cause a selectable indication of the received zone configuration to be displayed, where the displayed selectable indication is selectable to cause one or more of the zone scenes to be invoked by two or more of the plurality of Chromecast-enabled media players.</p> <p>For instance, as noted above, each Chromecast-enabled computing device is programmed with the capability to (i) receive a zone</p>

Claim: 1	Chromecast-Enabled Computing Devices
<p>one or more of the zone scenes to be invoked by two or more of the plurality of independent playback devices.</p>	<p>configuration characterizing one or more zone scenes that each identify a respective group configuration comprising two or more of the plurality of Chromecast-enabled media players (<i>e.g.</i>, one or more “speaker groups”), and (ii) cause an indication of the received zone configuration to be displayed that is selectable to cause a particular zone scene (<i>e.g.</i>, a “speaker group”) to be invoked by two or more of the plurality of Chromecast-enabled media players. <i>See, e.g.</i>, https://support.google.com/googlenest/answer/7174267?co=GENIE.Platform%3DAndroid&hl=en; https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en; https://support.google.com/googlenest/answer/7030379?co=GENIE.Platform%3DAndroid&hl=en-GB; https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084; https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1. Examples of this functionality are illustrated by the following screenshots from a Chromecast-enabled computing device running at least the Google Home, Google Play Music and YouTube Music apps, which show an indication of a received zone configuration characterizing a “Downstairs” “speaker group” that is selectable to cause the “Downstairs” “speaker group” to be invoked by the Chromecast-enabled media players included in the “Downstairs” “speaker group”:</p> <div> </div>

Claim: 1	Chromecast-Enabled Computing Devices
	

107. On September 28, 2020, Sonos provided Google with a draft of this complaint prior to its filing. That draft identified the '206 Patent and described how Google's products infringed. Thus, Google had actual knowledge of Sonos's allegation that Google infringed claims of the '206 Patent prior to Sonos filing the complaint in this action.

108. Additionally and/or alternatively, Google has indirectly infringed and continues to indirectly infringe one or more of the claims of the '206 Patent, in violation of 35 U.S.C. § 271(b), by actively inducing users of the Google Wireless Audio System to directly infringe the one or more claims of the '206 Patent. In particular, (a) Google had actual knowledge of the '206 Patent or was willfully blind to its existence prior to, and no later than, October 2016 and had actual knowledge or was willfully blind to Sonos's infringement allegations at least as early as September 28, 2020 when Sonos provided Google a copy of the complaint (*see* ¶¶ 19-29 above), (b) Google intentionally causes, urges, or encourages users of the Google Wireless Audio System to directly infringe one or more claims of the '206 Patent by promoting, advertising, and instructing customers and potential customers about the Google Wireless Audio System (including uses thereof) and encouraging such customers and potential customers to engage in activity that constitutes direct infringement (*see* Exs. 22-23; *see also* citations above in the exemplary infringement claim chart for claim 1 of the '206 Patent), (c) Google knows (or should know) that its actions will induce users of the Google Wireless Audio System to directly infringe

one or more claims the '206 Patent, and (d) users of the Google Wireless Audio System directly infringe one or more claims of the '206 Patent. For instance, at a minimum, Google has supplied and continues to supply the Google Home app to customers while knowing that installation and/or use of this app will infringe one or more claims of the '206 Patent, and that Google's customers then directly infringe one or more claims of the '206 Patent by installing and/or using this app in accordance with Google's product literature. *See, e.g., id.*

109. Additionally and/or alternatively, Google has indirectly infringed and continues to indirectly infringe one or more of the claims of the '206 Patent, in violation of 35 U.S.C. § 271(c), by offering to sell or selling within the United States, and/or importing into the United States, components in connection with the Google Wireless Audio System that contribute to the direct infringement of the '206 Patent by users of the Google Wireless Audio System. In particular, (a) Google had actual knowledge of the '206 Patent or was willfully blind to its existence prior to, and no later than, October 2016 and had actual knowledge or was willfully blind to Sonos's infringement allegations at least as early as September 28, 2020 when Sonos provided Google a copy of the complaint (*see* ¶¶ 19-29 above), (b) Google offers for sale, sells, and/or imports, in connection with the Google Wireless Audio System, one or more material components of the invention of the '206 Patent that are not staple articles of commerce suitable for substantial noninfringing use, (c) Google knows (or should know) that such component(s) were especially made or especially adapted for use in an infringement of the '206 Patent, and (d) users of devices that comprise such material component(s) directly infringe one or more claims of the '206 Patent. For instance, at a minimum, Google offers for sale, sells, and/or imports the Google Home app for installation on devices (*e.g.*, smartphones, tablets, and computers) that meet one or more claims of the '206 Patent. *See, e.g.*, Exs. 22-23. This app is a material component of the devices that meet the one or more claims of the '206 Patent. Further, Google especially made and/or adapted this app for installation and use on devices that meet the one or more claims of the '206 Patent, and this app is not a staple article of commerce suitable for substantial noninfringing use.

Google's customers then directly infringe the one or more claims of the '206 Patent by installing and/or using the Google Home app on the customers' devices.

110. Google's infringement of the '206 Patent is also willful because Google (a) had actual knowledge of the '206 Patent no later than October 2016 and actual knowledge of Sonos's infringement contentions no later than September 28, 2020 (*see* ¶¶ 19-29 above), (b) engaged in the aforementioned activity despite an objectively high likelihood that Google's actions constituted infringement of the '206 Patent, and (c) this objectively-defined risk was either known or so obvious that it should have been known to Google.

111. Additional allegations regarding Google's pre-suit knowledge of the '206 Patent and willful infringement will likely have evidentiary support after a reasonable opportunity for discovery.

112. Sonos is in compliance with any applicable marking and/or notice provisions of 35 U.S.C. § 287 with respect to the '206 Patent.

113. Sonos is entitled to recover from Google all damages that Sonos has sustained as a result of Google's infringement of the '206 Patent, including, without limitation, a reasonable royalty and lost profits.

114. Google's infringement of the '206 Patent was and continues to be willful and deliberate, entitling Sonos to enhanced damages.

115. Google's infringement of the '206 Patent is exceptional and entitles Sonos to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

116. Google's infringement of the '206 Patent has caused irreparable harm (including the loss of market share) to Sonos and will continue to do so unless enjoined by this Court.

COUNT IV: INFRINGEMENT OF U.S. PATENT NO. 10,469,966

117. Sonos incorporates by reference and re-alleges paragraphs 1-79 of this Complaint as if fully set forth herein.

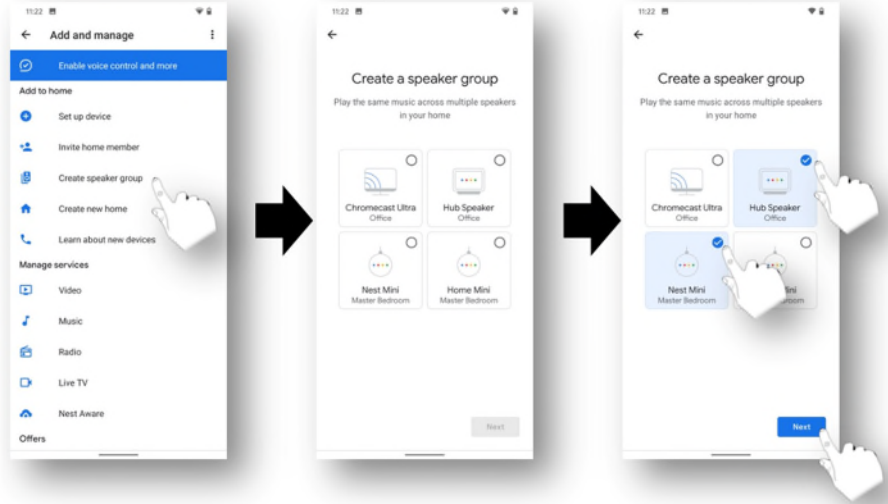
118. Google and/or users of the Google Wireless Audio System have directly infringed (either literally or under the doctrine of equivalents) and continue to directly infringe one or more

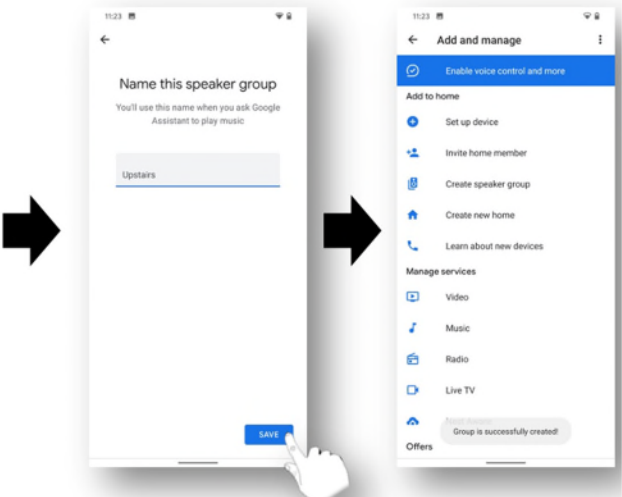
of the claims of the '966 Patent, in violation of 35 U.S.C. § 271(a), by making, using, offering for sale, and/or selling the Google Wireless Audio System within the United States and/or importing the Google Wireless Audio System into the United States without authority or license.

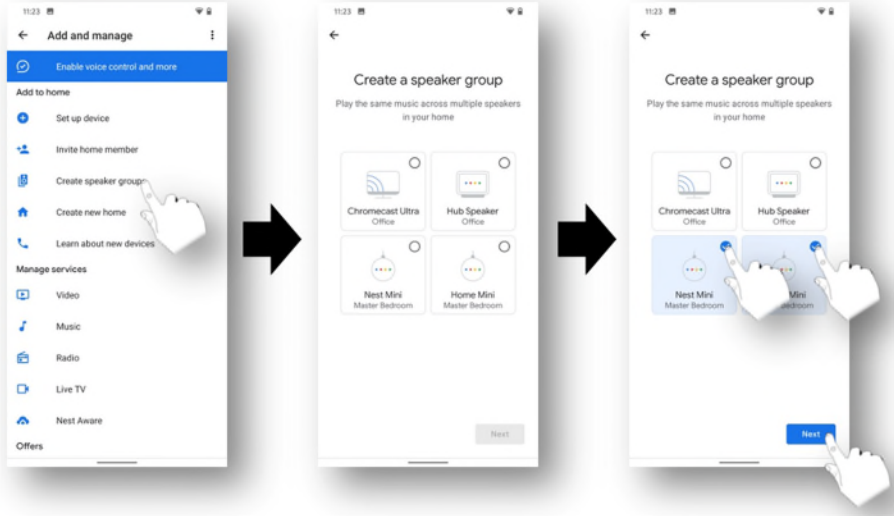
119. As just one non-limiting example, set forth below is an exemplary infringement claim chart for claim 1 of the '966 Patent in connection with the Google Wireless Audio System. This claim chart is based on publicly available information. Sonos reserves the right to modify this claim chart, including, for example, on the basis of information about the Google Wireless Audio System that it obtains during discovery.

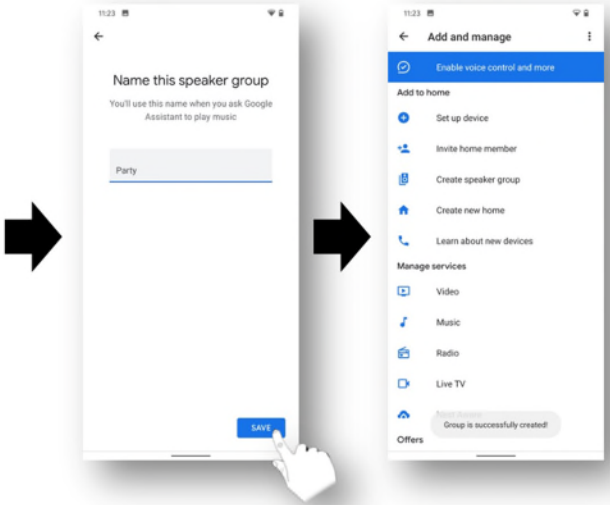
Claim: 1	Chromecast-Enabled Computing Devices
A computing device comprising:	At least each smartphone, tablet, and computer installed with at least the Google Home app (where a computing device installed with at least the Google Home app is referred to herein as a "Chromecast-enabled computing device") comprises a "computing device," as recited in claim 1. At least each Home Mini, Nest Mini, Home, Home Max, Home Hub, Nest Hub, Nest Hub Max, Nest Wifi Point, Chromecast, Chromecast Audio, Chromecast Ultra, Chromecast with Google TV, and Nest Audio ("Chromecast-enabled media player") is a data network device configured to process and output audio, and thus, comprises a "zone player" as recited in claim 1. <i>See, e.g.,</i> https://store.google.com/us/magazine/compare_pixel ; https://store.google.com/us/product/google_pixelbook_specs ; https://store.google.com/us/product/pixel_slate_specs ; https://store.google.com/us/product/google_home_max?hl=en-US ; https://store.google.com/us/product/google_home_max_partners?hl=en-US ; https://play.google.com/store/apps/details?id=com.google.android.apps.chromecast.app&hl=en_US .
one or more processors;	Each Chromecast-enabled computing device includes one or more processors. <i>See, e.g.,</i> https://store.google.com/us/magazine/compare_pixel ; https://store.google.com/us/product/google_pixelbook_specs ; https://store.google.com/us/product/pixel_slate_specs .
a non-transitory computer-readable medium; and	Each Chromecast-enabled computing device includes a non-transitory computer-readable medium. <i>See, e.g.,</i> https://store.google.com/us/magazine/compare_pixel ; https://store.google.com/us/product/google_pixelbook_specs ; https://store.google.com/us/product/pixel_slate_specs .

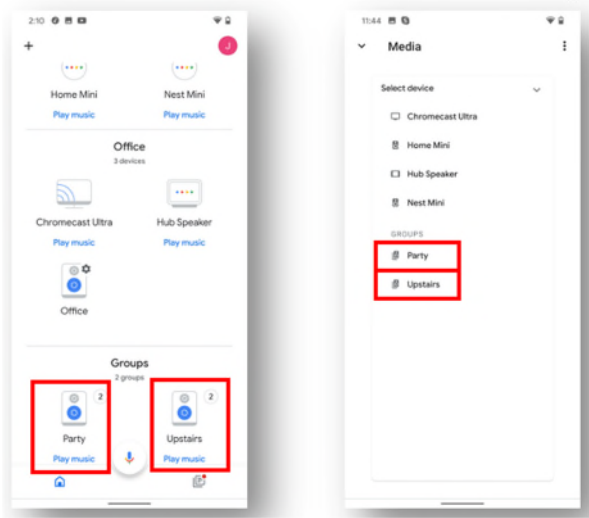
Claim: 1	Chromecast-Enabled Computing Devices
program instructions stored on the non-transitory computer-readable medium that, when executed by the one or more processors, cause the computing device to perform functions comprising:	Each Chromecast-enabled computing device includes program instructions stored on the non-transitory computer-readable medium that enable the Chromecast-enabled computing device to perform the functions identified below. <i>See, e.g.</i> , https://store.google.com/us/magazine/compare_pixel ; https://store.google.com/us/product/google_pixelbook_specs ; https://store.google.com/us/product/pixel_slate_specs .
while serving as a controller for a networked media playback system comprising a first zone player and at least two other zone players, wherein the first zone player is operating in a standalone mode in which the first zone player is configured to play back media individually:	Each Chromecast-enabled computing device comprises program instructions that, when executed by a Chromecast-enabled computing device's one or more processors, cause that Chromecast-enabled computing device to, while serving as a Chromecast-enabled computing device for a Chromecast-enabled playback system comprising a first Chromecast-enabled media player and at least two other Chromecast-enabled media players, where the first Chromecast-enabled media player is operating in a standalone mode in which the first Chromecast-enabled media player is configured to play back media individually, perform the functions identified below. For instance, each Chromecast-enabled computing device is programmed with the capability to serve as a controller for a Chromecast-enabled playback system that includes a first Chromecast-enabled media player and at least two other Chromecast-enabled media players, where at least the first Chromecast-enabled media player is operating in a standalone mode (<i>i.e.</i> , the first Chromecast-enabled media player is not operating part of an established "cast session" with a "speaker group"). <i>See, e.g.</i> , https://support.google.com/googlenest/answer/7174267?co=GENIE.Platform%3DAndroid&hl=en ; https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en ; https://support.google.com/googlenest/answer/7030379?co=GENIE.Platform%3DAndroid&hl=en-GB ; https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084 ; https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1 .
receiving a first request to create a first zone scene comprising a first predefined grouping of zone players	Each Chromecast-enabled computing device comprises program instructions that, when executed by a Chromecast-enabled computing device's one or more processors, cause that Chromecast-enabled computing device to receive a first request to create a first zone scene comprising a first predefined grouping of Chromecast-enabled media players including at least the first Chromecast-enabled media player

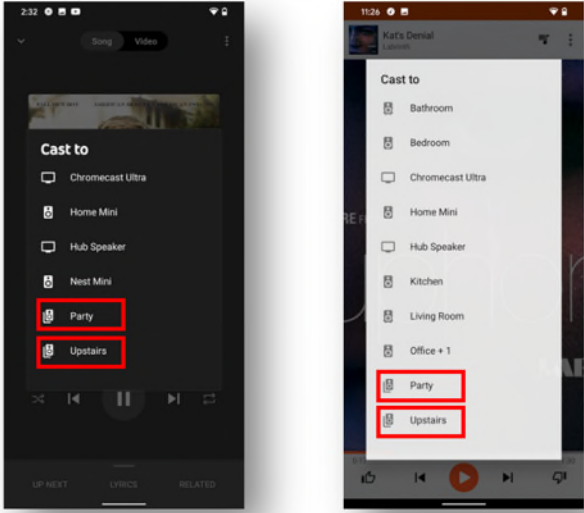
Claim: 1	Chromecast-Enabled Computing Devices
<p>including at least the first zone player and a second zone player that are to be configured for synchronous playback of media when the first zone scene is invoked;</p>	<p>and a second Chromecast-enabled media player that are to be configured for synchronous playback of media when the first zone scene is invoked.</p> <p>For instance, each Chromecast-enabled computing device is programmed such that, while serving as a controller for a Chromecast-enabled playback system that includes a first Chromecast-enabled media player and at least two other Chromecast-enabled media players, the Chromecast-enabled computing device is operable to receive a request to create a first predefined “speaker group” that includes the first Chromecast-enabled media player and a second Chromecast-enabled media player in the Chromecast-enabled playback system that are to be configured for synchronous playback of media when the first “speaker group” is launched, which is a “a first zone scene comprising a first predefined grouping of zone players including at least the first zone player and a second zone player that are to be configured for synchronous playback of media when the first zone scene is invoked.” <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7174267?co=GENIE.Platform%3DAndroid&hl=en (providing instructions on how to create “speaker groups” for “synchronous music throughout the home”). One example of this functionality is illustrated by the following screenshots, which shows the creation of an “Upstairs” “speaker group” that includes the “Nest Mini” and “Hub Speaker” players:</p> 

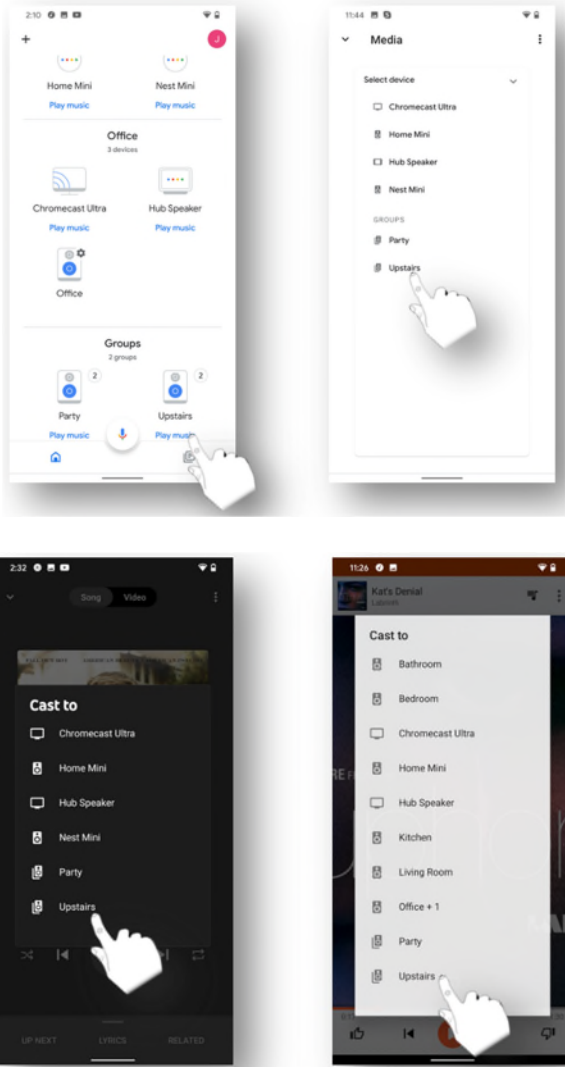
Claim: 1	Chromecast-Enabled Computing Devices
	
<p>based on the first request, i) causing creation of the first zone scene, ii) causing an indication of the first zone scene to be transmitted to the first zone player, and iii) causing storage of the first zone scene;</p>	<p>Each Chromecast-enabled computing device comprises program instructions that, when executed by a Chromecast-enabled computing device's one or more processors, cause that Chromecast-enabled computing device to, based on the first request, (i) cause creation of the first zone scene, (ii) cause an indication of the first zone scene to be transmitted to the first Chromecast-enabled media player, and (iii) cause storage of the first zone scene.</p> <p>For instance, each Chromecast-enabled computing device is programmed such that, while serving as a controller for a Chromecast-enabled playback system that includes a first Chromecast-enabled media player and at least two other Chromecast-enabled media players, the Chromecast-enabled computing device is operable to receive a request to create a first predefined "speaker group" including the first Chromecast-enabled media player and a second Chromecast-enabled media player in the Chromecast-enabled playback system (which is the claimed "first zone scene") and then based on the request, (i) cause creation of the first "speaker group," (ii) cause an indication of the first "speaker group" to be transmitted to the first Chromecast-enabled media player, and (iii) cause storage of the first "speaker group" at one or more Chromecast-enabled media players. <i>See e.g.</i>, https://support.google.com/googlenest/answer/7174267?co=GENIE.Platform%3DAndroid&hl=en (providing instructions on how to create "speaker groups").</p>
<p>receiving a second request to create a second zone scene comprising a second predefined grouping of zone players</p>	<p>Each Chromecast-enabled computing device comprises program instructions that, when executed by a Chromecast-enabled computing device's one or more processors, cause that Chromecast-enabled computing device to receive a second request to create a second zone scene comprising a second predefined grouping of Chromecast-enabled media players including at least the first Chromecast-enabled</p>

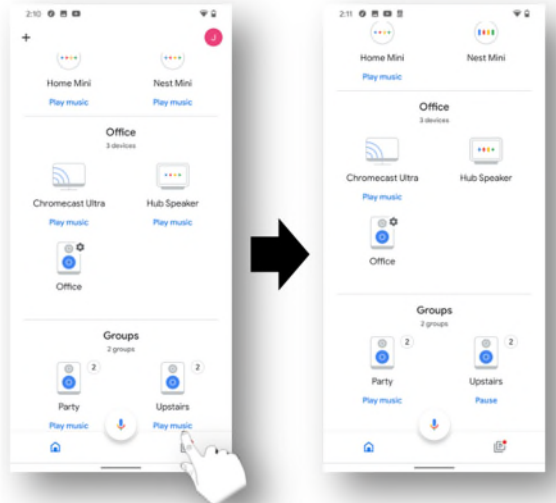
Claim: 1	Chromecast-Enabled Computing Devices
<p>including at least the first zone player and a third zone player that are to be configured for synchronous playback of media when the second zone scene is invoked, wherein the third zone player is different than the second zone player;</p>	<p>media player and a third Chromecast-enabled media player that are to be configured for synchronous playback of media when the second zone scene is invoked, where the third Chromecast-enabled media player is different than the second Chromecast-enabled media player.</p> <p>For instance, each Chromecast-enabled computing device is programmed such that, while serving as a controller for a Chromecast-enabled playback system that includes a first Chromecast-enabled media player and at least two other Chromecast-enabled media players, the Chromecast-enabled computing device is configured to receive a request to create a first predefined “speaker group” that includes the first Chromecast-enabled media player and a third Chromecast-enabled media player that are to be configured for synchronous playback of media when the second “speaker group” is launched, which is a “a second zone scene comprising a second predefined grouping of zone players including at least the first zone player and a third zone player that are to be configured for synchronous playback of media when the second zone scene is invoked.” <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7174267?co=GENIE.Platform%3DAndroid&hl=en (providing instructions on how to create “speaker groups” for “synchronous music throughout the home”). One example of this functionality is illustrated by the following screenshots, which shows the creation of a “Party” “speaker group” that includes the “Nest Mini” and “Home Mini” players:</p> 

Claim: 1	Chromecast-Enabled Computing Devices
	
<p>based on the second request, i) causing creation of the second zone scene, ii) causing an indication of the second zone scene to be transmitted to the first zone player, and iii) causing storage of the second zone scene;</p>	<p>Each Chromecast-enabled computing device comprises program instructions that, when executed by a Chromecast-enabled computing device's one or more processors, cause that Chromecast-enabled computing device to, based on the second request, (i) cause creation of the second zone scene, (ii) cause an indication of the second zone scene to be transmitted to the first Chromecast-enabled media player, and (iii) cause storage of the second zone scene.</p> <p>For instance, each Chromecast-enabled computing device is programmed such that, while serving as a controller for a Chromecast-enabled playback system that includes a first Chromecast-enabled media player and at least two other Chromecast-enabled media players, the Chromecast-enabled computing device is operable to receive a request to create a second predefined "speaker group" including the first Chromecast-enabled media player and a third Chromecast-enabled media player in the Chromecast-enabled playback system (which is the claimed "second zone scene") and then based on the request, (i) cause creation of the second "speaker group," (ii) cause an indication of the second "speaker group" to be transmitted to the first Chromecast-enabled media player, and (iii) cause storage of the second "speaker group" at one or more Chromecast-enabled media players. <i>See e.g.</i>, https://support.google.com/googlenest/answer/7174267?co=GENIE.Platform%3DAndroid&hl=en (providing instructions on how to create "speaker groups").</p>
<p>displaying a representation of the first zone scene and a representation of the second zone scene; and</p>	<p>Each Chromecast-enabled computing device comprises program instructions that, when executed by a Chromecast-enabled computing device's one or more processors, cause that Chromecast-enabled computing device to display a representation of the first zone scene and a representation of the second zone scene.</p>

Claim: 1	Chromecast-Enabled Computing Devices
	<p>For instance, each Chromecast-enabled computing device is programmed such that, while serving as a controller for a Chromecast-enabled playback system that includes a first Chromecast-enabled media player and at least two other Chromecast-enabled media players that are each, the Chromecast-enabled computing device is operable to display (i) a representation of a first predefined “speaker group” including the first Chromecast-enabled media player and a second Chromecast-enabled media player (which is the claimed “first zone scene”), and (ii) a representation of a second predefined “speaker group” including the first Chromecast-enabled media player and a third Chromecast-enabled media player (which is the claimed second zone scene”). <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7174267?co=GENIE.Platform%3DAndroid&hl=en; https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en; https://support.google.com/googlenest/answer/7030379?co=GENIE.Platform%3DAndroid&hl=en-GB; https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084; https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1.</p> <p>Examples of this functionality are illustrated by the following screenshots from a Chromecast-enabled computing device installed with at least the Google Home, Google Play Music, and YouTube Music apps, which show a displayed representation of the “Upstairs” “speaker group” that includes the “Nest Mini” and “Hub Speaker” players, and a displayed representation of the “Party” “speaker group” that includes the “Nest Mini” and “Home Mini” players:</p> 

Claim: 1	Chromecast-Enabled Computing Devices
	
<p>while displaying the representation of the first zone scene and the representation of the second zone scene, receiving a third request to invoke the first zone scene; and</p>	<p>Each Chromecast-enabled computing device comprises program instructions that, when executed by a Chromecast-enabled computing device's one or more processors, cause that Chromecast-enabled computing device to, while displaying the representation of the first zone scene and the representation of the second zone scene, receive a third request to invoke the first zone scene.</p> <p>For instance, each Chromecast-enabled computing device is programmed such that, while displaying (i) a representation of a first predefined "speaker group" including the first Chromecast-enabled media player and a second Chromecast-enabled media player (which is the claimed "first zone scene"), and (ii) a representation of a second predefined "speaker group" including the first Chromecast-enabled media player and a third Chromecast-enabled media player (which is the claimed second zone scene"), the Chromecast-enabled computing device is operable to receive a request to launch the first "speaker group," which is a "request to invoke the first zone scene." See, e.g.,</p> <p>https://support.google.com/googlenest/answer/7174267?co=GENIE.Platform%3DAndroid&hl=en;</p> <p>https://support.google.com/chromecast/answer/6178107?co=GENIE.Platform%3DAndroid&hl=en;</p> <p>https://support.google.com/googlenest/answer/7030379?co=GENIE.Platform%3DAndroid&hl=en-GB;</p> <p>https://support.google.com/googlenest/answer/7181830?hl=en-GB&ref_topic=7030084;</p> <p>https://support.google.com/chromecast/answer/3228332?hl=en-GB&ref_topic=4602553&co=GENIE.Platform%3DDesktop&oco=1.</p> <p>Examples of this functionality are illustrated by the following screenshots from a Chromecast-enabled computing device installed with at least the Google Home, Google Play Music, and YouTube</p>

Claim: 1	Chromecast-Enabled Computing Devices
	<p>Music apps, which show receipt of a request to launch the “Upstairs” “speaker pair”:</p> 
<p>based on the third request, causing the first zone player to transition from operating in the standalone mode to operating in accordance with the first predefined grouping of zone players such that the first zone player is configured to</p>	<p>Each Chromecast-enabled computing device comprises program instructions that, when executed by a Chromecast-enabled computing device’s one or more processors, cause that Chromecast-enabled computing device to, based on the third request, cause the first Chromecast-enabled media player to transition from operating in the standalone mode to operating in accordance with the first predefined grouping of Chromecast-enabled media players such that the first Chromecast-enabled media player is configured to coordinate with at least the second Chromecast-enabled media player to output media in synchrony with output of media by at least the second Chromecast-enabled media player.</p>

Claim: 1	Chromecast-Enabled Computing Devices
<p>coordinate with at least the second zone player to output media in synchrony with output of media by at least the second zone player.</p>	<p>For instance, each Chromecast-enabled computing device is programmed such that, based on a request to launch a first “speaker group” (which is the claimed “third request to invoke the first zone scene”), the Chromecast-enabled computing device is operable to cause the first Chromecast-enabled media player to transition from operating in a standalone mode to operating in accordance with the first “speaker group” such that the first Chromecast-enabled media player is configured to coordinate with at least the second Chromecast-enabled media player to output audio in synchrony with the output of audio by the second Chromecast-enabled media player. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7174267?co=GENIE.Platform%3DAndroid&hl=en (“Group any combination of Google Nest or Google Home speakers and displays and Chromecast devices together for synchronous music throughout the home.”). Examples of this functionality are illustrated by the following screenshots from a Chromecast-enabled computing device installed with at least the Google Home, Google Play Music, and YouTube Music apps, which show the “Upstairs” “speaker group” being launched such that the “Nest Mini” and “Hub Speaker” players are configured to coordinate with one another to play audio in synchrony:</p> 

Claim: 1	Chromecast-Enabled Computing Devices

120. On September 28, 2020, Sonos provided Google with a draft of this complaint prior to its filing. That draft identified the '966 Patent and described how Google's products infringed. Thus, Google had actual knowledge of Sonos's allegation that Google infringed claims of the '966 Patent prior to Sonos filing the complaint in this action.

121. Additionally and/or alternatively, Google has indirectly infringed and continues to indirectly infringe one or more of the claims of the '966 Patent, in violation of 35 U.S.C. § 271(b), by actively inducing users of the Google Wireless Audio System to directly infringe the one or more claims of the '966 Patent. In particular, (a) Google had actual knowledge of the '966 Patent and Sonos's infringement contentions, or was willfully blind to their existence, no later than September 28, 2020 when Sonos provided Google with a copy of the complaint (*see* ¶¶ 19-29 above), (b) Google intentionally causes, urges, or encourages users of the Google Wireless Audio System to directly infringe one or more claims of the '966 Patent by promoting, advertising, and instructing customers and potential customers about the Google Wireless Audio System (including uses thereof) and encouraging such customers and potential customers to engage in activity that constitutes direct infringement (*see* Exs. 22-23; *see also* citations above in the exemplary infringement claim chart for claim 1 of the '966 Patent), (c) Google knows (or should know) that its actions will induce users of the Google Wireless Audio System to directly infringe one or more claims the '966 Patent, and (d) users of the Google Wireless Audio System directly infringe one or more claims of the '966 Patent. For instance, at a minimum, Google has supplied and continues to supply the Google Home app to customers while knowing that installation and/or use of this app will infringe one or more claims of the '966 Patent, and that Google's customers then directly infringe one or more claims of the '966 Patent by installing and/or using this app in accordance with Google's product literature. *See, e.g., id.*

122. Additionally and/or alternatively, Google has indirectly infringed and continues to indirectly infringe one or more of the claims of the '966 Patent, in violation of 35 U.S.C. § 271(c), by offering to sell or selling within the United States, and/or importing into the United States, components in connection with the Google Wireless Audio System that contribute to the direct

infringement of the '966 Patent by users of the Google Wireless Audio System. In particular, (a) Google had actual knowledge of the '966 Patent and Sonos's infringement contentions, or was willfully blind to their existence, no later than September 28, 2020 when Sonos provided Google with a copy of the complaint (*see* ¶¶ 19-29 above), (b) Google offers for sale, sells, and/or imports, in connection with the Google Wireless Audio System, one or more material components of the invention of the '966 Patent that are not staple articles of commerce suitable for substantial noninfringing use, (c) Google knows (or should know) that such component(s) were especially made or especially adapted for use in an infringement of the '966 Patent, and (d) users of devices that comprise such material component(s) directly infringe one or more claims of the '966 Patent. For instance, at a minimum, Google offers for sale, sells, and/or imports the Google Home app for installation on devices (*e.g.*, smartphones, tablets, and computers) that meet one or more claims of the '966 Patent. *See, e.g.*, Exs. 22-23. This app is a material component of the devices that meet the one or more claims of the '966 Patent. Further, Google especially made and/or adapted this app for installation and use on devices that meet the one or more claims of the '966 Patent, and this app is not a staple article of commerce suitable for substantial noninfringing use. Google's customers then directly infringe the one or more claims of the '966 Patent by installing and/or using the Google Home app on the customers' devices.

123. Google's infringement of the '966 Patent is also willful because Google (a) had actual knowledge of the '966 Patent and actual knowledge of Sonos's infringement contentions no later than September 28, 2020 (*see* ¶¶ 19-29 above), (b) engaged in the aforementioned activity despite an objectively high likelihood that Google's actions constituted infringement of the '966 Patent, and (c) this objectively-defined risk was either known or so obvious that it should have been known to Google.

124. Additional allegations regarding Google's pre-suit knowledge of the '966 Patent and willful infringement will likely have evidentiary support after a reasonable opportunity for discovery.

125. Sonos is in compliance with any applicable marking and/or notice provisions of 35 U.S.C. § 287 with respect to the '966 Patent.

126. Sonos is entitled to recover from Google all damages that Sonos has sustained as a result of Google's infringement of the '966 Patent, including, without limitation, a reasonable royalty and lost profits.

127. Google's infringement of the '966 Patent was and continues to be willful and deliberate, entitling Sonos to enhanced damages.

128. Google's infringement of the '966 Patent is exceptional and entitles Sonos to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

129. Google's infringement of the '966 Patent has caused irreparable harm (including the loss of market share) to Sonos and will continue to do so unless enjoined by this Court.

COUNT V: INFRINGEMENT OF U.S. PATENT NO. 9,219,460

130. Sonos incorporates by reference and re-alleges paragraphs 1-79 of this Complaint as if fully set forth herein.

131. Google and/or users of the Google Wireless Audio System have directly infringed (either literally or under the doctrine of equivalents) and continue to directly infringe one or more of the claims of the '460 Patent, in violation of 35 U.S.C. § 271(a), by making, using, offering for sale, and/or selling the Google Wireless Audio System within the United States and/or importing the Google Wireless Audio System into the United States without authority or license.

132. As just one non-limiting example, set forth below is an exemplary infringement claim chart for claim 15 of the '460 Patent in connection with the Google Wireless Audio System. This claim chart is based on publicly available information. Sonos reserves the right to modify this claim chart, including, for example, on the basis of information about the Google Wireless Audio System that it obtains during discovery.

Claim: 15	Chromecast-Enabled Media Players
A playback device, comprising:	At least each Google Home Max and Nest Audio player (referred to herein as a "Chromecast-enabled media player") comprises a "playback device," as recited in claim 15.

Claim: 15	Chromecast-Enabled Media Players
a speaker;	Each of the foregoing Chromecast-enabled media players includes a speaker. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7072284?hl=en ; https://store.google.com/us/product/google_home_max_specs_speaker?hl=en-US .
a microphone that is physically coupled to the speaker;	Each of the foregoing Chromecast-enabled media players includes a microphone that is physically coupled to the speaker. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7072284?hl=en ; https://store.google.com/us/product/google_home_max_specs_speaker?hl=en-US .
a processor;	Each of the foregoing Chromecast-enabled media players includes a processor. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7072284?hl=en ; https://store.google.com/us/product/google_home_max_specs_speaker?hl=en-US .
a network interface;	Each of the foregoing Chromecast-enabled media players includes a network interface, such as a WiFi interface. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7072284?hl=en ; https://store.google.com/us/product/google_home_max_specs_speaker?hl=en-US .
a data storage; and a program logic stored in the data storage and executable by the processor to:	Each of the foregoing Chromecast-enabled media players includes a data storage and executable program logic stored in the data storage that enable each Chromecast-enabled media player to perform the functions identified below. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7072284?hl=en ; https://store.google.com/us/product/google_home_max_specs_speaker?hl=en-US .
emit a first audio signal from the speaker;	Each of the foregoing Chromecast-enabled media players comprises program logic that, when executed by the Chromecast-enabled media player's processor, causes that Chromecast-enabled media player to emit a first audio signal from the speaker. For instance, each of the foregoing Chromecast-enabled media players is programmed with the capability to emit a first audio signal from one of its speakers to facilitate measuring the acoustics of a space surrounding the Chromecast-enabled media player. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7585574?hl=en (“Once you set up Max, Room EQ measures the acoustics of your space.”); https://www.youtube.com/watch?v=UiBhshQ0FQA (“With Smart Sound, Google Home Max uses machine learning to automatically adjust the equalizer settings to match the acoustics of your room.”).
detect, via the microphone, a second audio signal, wherein at least a portion of	Each of the foregoing Chromecast-enabled media players comprises program logic that, when executed by the Chromecast-enabled media player's processor, causes that Chromecast-enabled media player to detect, via its microphone, a second audio signal, wherein at least a

Claim: 15	Chromecast-Enabled Media Players
the second audio signal is a reflection of the first audio signal;	<p>portion of the second audio signal is a reflection of the first audio signal.</p> <p>For instance, each of the foregoing Chromecast-enabled media players is programmed with the capability to detect, via its microphone, a second audio signal, where at least a portion of the second audio signal is a reflection of the first audio signal that was emitted to facilitate measuring the acoustics of a space surrounding the Chromecast-enabled media player. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7585574?hl=en (“Once you set up Max, Room EQ measures the acoustics of your space. . . . Note: The microphone must be on for Room EQ to work.”); https://www.youtube.com/watch?v=UiBhshQ0FQA (disclosing that the Google Home Max “uses six internal microphones to measure the acoustics of your room.”).</p>
in response to the detecting, determine a first reflection characteristic based on at least the second audio signal;	<p>Each of the foregoing Chromecast-enabled media players comprises program logic that, when executed by the Chromecast-enabled media player’s processor, causes that Chromecast-enabled media player to, in response to the detecting, determine a first reflection characteristic based on at least the second audio signal.</p> <p>For instance, each of the foregoing Chromecast-enabled media players is programmed such that, in response to detecting a second audio signal comprising a reflection of a first audio signal that was emitted to facilitate measuring the acoustics of a space surrounding the Chromecast-enabled media player, the Chromecast-enabled media player is configured to determine one or more reflection characteristics based on at least the detected second audio signal. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7585574?hl=en (“Walls in a room can amplify the bass, leading to a muddled sound in which the bass overpowers the vocals of your music. Room EQ automatically corrects for this excess bass. This leads to a more balanced sound.”); https://www.youtube.com/watch?v=UiBhshQ0FQA.</p>
adjust an equalization setting of the playback device based on at least the first reflection characteristic; and	<p>Each of the foregoing Chromecast-enabled media players comprises program logic that, when executed by the Chromecast-enabled media player’s processor, causes that Chromecast-enabled media player to adjust the equalization setting of the Chromecast-enabled media player based on at least the first reflection characteristic.</p> <p>For instance, each of the foregoing Chromecast-enabled media players is programmed with the capability to adjust its equalization setting (e.g., a “bass” setting) based on one or more reflection characteristics. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7585574?hl=en</p>

Claim: 15	Chromecast-Enabled Media Players
	<p>(“Room EQ automatically corrects for this excess bass. This leads to a more balanced sound.”); https://www.youtube.com/watch?v=UiBhshQ0FQA (“With Smart Sound, Google Home Max uses machine learning to automatically adjust the equalizer settings to match the acoustics of your room.”).</p>
<p>play, via the speaker, an audio track according to the equalization setting.</p>	<p>Each of the foregoing Chromecast-enabled media players comprises program logic that, when executed by the Chromecast-enabled media player’s processor, causes that Chromecast-enabled media player to play, via its speaker, an audio track according to the equalization setting.</p> <p>For instance, each of the foregoing Chromecast-enabled media players is programmed with the capability to play, via one of its speakers, audio according to the equalization setting (e.g., “bass” setting) that was adjusted as described above. <i>See, e.g.,</i> https://support.google.com/googlenest/answer/7585574?hl=en (“Room EQ automatically corrects for this excess bass. This leads to a more balanced sound.”); https://www.youtube.com/watch?v=UiBhshQ0FQA (“With Smart Sound, Google Home Max uses machine learning to automatically adjust the equalizer settings to match the acoustics of your room.”).</p>

133. On September 28, 2020, Sonos provided Google with a draft of this complaint prior to its filing. That draft identified the ’460 Patent and described how Google’s products infringed. Thus, Google had actual knowledge of Sonos’s allegation that Google infringed claims of the ’460 Patent prior to Sonos filing the complaint in this action.

134. Additionally and/or alternatively, Google has indirectly infringed and continues to indirectly infringe one or more of the claims of the ’460 Patent, in violation of 35 U.S.C. § 271(b), by actively inducing users of the Google Wireless Audio System to directly infringe the one or more claims of the ’460 Patent. In particular, (a) Google had actual knowledge of the ’460 Patent or was willfully blind to its existence prior to, and no later than, January 2018 and had actual knowledge or was willfully blind to Sonos’s infringement allegations at least as early as September 28, 2020 when Sonos provided Google a copy of the complaint (*see* ¶¶ 19-29 above), (b) Google intentionally causes, urges, or encourages users of the Google Wireless Audio System to directly infringe one or more claims of the ’460 Patent by promoting, advertising, and instructing customers and potential customers about the Google Wireless Audio System

(including uses thereof) and encouraging such customers and potential customers to engage in activity that constitutes direct infringement (*see* citations above in the exemplary infringement claim chart for claim 15 of the '460 Patent; *see also* Ex. 42), (c) Google knows (or should know) that its actions will induce users of the Google Wireless Audio System to directly infringe one or more claims of the '460 Patent, and (d) users of the Google Wireless Audio System directly infringe one or more claims of the '460 Patent. For instance, at a minimum, Google has supplied and continues to supply the Google Home Max and Nest Audio to customers while knowing that use of these products will infringe one or more claims of the '460 Patent and that Google's customers then directly infringe one or more claims of the '460 Patent by using the Google Home Max and Nest Audio in accordance with Google's product literature. *See, e.g., id.*

135. Additionally and/or alternatively, Google has indirectly infringed and continues to indirectly infringe one or more of the claims of the '460 Patent, in violation of 35 U.S.C. § 271(c), by offering to sell or selling within the United States, and/or importing into the United States, components in connection with the Google Wireless Audio System that contribute to the direct infringement of the '460 Patent by users of the Google Wireless Audio System. In particular, (a) Google had actual knowledge of the '460 Patent or was willfully blind to its existence prior to, and no later than, January 2018 and had actual knowledge or was willfully blind to Sonos's infringement allegations at least as early as September 28, 2020 when Sonos provided Google a copy of the complaint (*see* ¶¶ 19-29 above), (b) Google offers for sale, sells, and/or imports, in connection with the Google Wireless Audio System, one or more material components of the invention of the '460 Patent that are not staple articles of commerce suitable for substantial noninfringing use, (c) Google knows (or should know) that such component(s) were especially made or especially adapted for use in an infringement of the '460 Patent, and (d) users of devices that comprise such material component(s) directly infringe one or more claims of the '460 Patent. For instance, at a minimum, Google offers for sale, sells, and/or imports software updates for the Google Home Max and Nest Audio that meet one or more claims of the '460 Patent. *See, e.g., Ex. 43.* These software updates are material components of the Google Home Max and Nest

Audio that meet the one or more claims of the '460 Patent. Further, Google especially made and/or adapted these software updates for installation and use on the Google Home Max and Nest Audio that meet the one or more claims of the '460 Patent, and these software updates are not staple articles of commerce suitable for substantial noninfringing use. Google's customers then directly infringe the one or more claims of the '460 Patent by installing and using software updates on the Google Home Max and Nest Audio.

136. Google's infringement of the '460 Patent is also willful because Google (a) had actual knowledge of the '460 Patent no later than January 2018 and actual notice of Sonos's infringement contentions no later than September 28, 2020 (*see* ¶¶ 19-29 above), (b) engaged in the aforementioned activity despite an objectively high likelihood that Google's actions constituted infringement of the '460 Patent, and (c) this objectively-defined risk was either known or so obvious that it should have been known to Google.

137. Additional allegations regarding Google's pre-suit knowledge of the '460 Patent and willful infringement will likely have evidentiary support after a reasonable opportunity for discovery.

138. Sonos is entitled to recover from Google all damages that Sonos has sustained as a result of Google's infringement of the '460 Patent, including, without limitation, a reasonable royalty and lost profits.

139. Google's infringement of the '460 Patent was and continues to be willful and deliberate, entitling Sonos to enhanced damages.

140. Google's infringement of the '460 Patent is exceptional and entitles Sonos to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. § 285. Google's infringement of the '460 Patent has caused irreparable harm (including the loss of market share) to Sonos and will continue to do so unless enjoined by this Court.

PRAYER FOR RELIEF

WHEREFORE, Sonos respectfully requests:

- A. That Judgment be entered that Google has infringed at least one or more claims of the patents-in-suit, directly and/or indirectly, literally and/or under the doctrine of equivalents, and that such infringement is willful;
- B. An injunction enjoining Google, its officers, agents, servants, employees and attorneys, and other persons in active concert or participation with Google, and its parents, subsidiaries, divisions, successors and assigns, from further infringement of the patents-in-suit.
- C. An award of damages sufficient to compensate Sonos for Google's infringement under 35 U.S.C. § 284, including an enhancement of damages on account of Google's willful infringement;
- D. That the case be found exceptional under 35 U.S.C. § 285 and that Sonos be awarded its reasonable attorneys' fees;
- E. Costs and expenses in this action;
- F. An award of prejudgment and post-judgment interest; and
- G. Such other and further relief as the Court may deem just and proper.

DEMAND FOR JURY TRIAL

Pursuant to Rule 38(b) of the Federal Rules of Civil Procedure, Sonos respectfully demands a trial by jury on all issues triable by jury.

Respectfully submitted,

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10 UNITED STATES DISTRICT COURT
11 NORTHERN DISTRICT OF CALIFORNIA
12 SAN FRANCISCO DIVISION
13

14 GOOGLE INC.,

15 Plaintiff,

16 v.

17 EOLAS TECHNOLOGIES
18 INCORPORATED,

19 Defendant.

Case No. 3:15-cv-05446-JST

**GOOGLE INC.'S OPPOSITION TO
EOLAS TECHNOLOGIES
INCORPORATED'S MOTION TO
DISMISS**

Hearing:

Date: April 21, 2016

Time: 2:00 PM

Place: Courtroom 9

Judge: Hon. Jon S. Tigar

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Statutes and Rules

11	28 U.S.C. § 1400	22
12	28 U.S.C. § 1404(a).....	2, 20, 21, 22, 23, 25
13	Cal. Civ. Proc. Code § 410.10.....	10
14	Fed. R. Civ. P. 4(k)(1)(A)	10
15	Fed. R. Civ. P. 45(c)(1)	23

Other Authorities

16	Restatement (Second) of Conflict of Laws § 188	16
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INTRODUCTION

Defendant Eolas Technologies Inc.’s motion to dismiss Plaintiff Google’s complaint for declaratory judgment of non-infringement of U.S. Patent No. 9,195,507 (“the ‘507 patent”) should be denied. Eolas fails to show that this Court does not have personal jurisdiction over Eolas and this Court should exercise its discretion to decline jurisdiction under the first-to-file rule.

Initially, Eolas fails to rebut Google’s prima facie showing that Eolas has sufficient minimum contacts with California to justify personal jurisdiction. Rather, just as they did less than two years ago when this Court denied a similar motion to dismiss, the facts demonstrate the opposite. The ‘507 patent is the latest patent to issue from continuation applications claiming priority to U.S. Patent Application No. 08/324,443 (“the ‘443 application”). It concerns an alleged invention for providing interactive content embedded in web pages conceived at the University of California, San Francisco by three inventors, two of whom still reside in this district. Since being created in California in 1994, Eolas has maintained a relationship with the Regents of the University of California (“the Regents”), embodied in a longstanding exclusive license agreement covering patents deriving from the ‘443 application (collectively, “the ‘443 patent family”). This agreement was recently terminated in favor of a patent assignment agreement through which the Regents get 5% of Eolas’ net revenues from licensing the ‘443 patent family. Eolas and the Regents then amended that patent assignment agreement one business day before filing the motion to dismiss. Eolas argues that this amendment avoids this Court’s exercise of personal jurisdiction by changing some of the parties’ duties. As a matter of law, however, the amendment is irrelevant because contacts are judged when the cause of action arose, here the day the case was filed. But even if considered, the amendment only further shows that Eolas’ relationship with the Regents, which has lasted for over twenty years and has long subjected Eolas to significant continuing obligations to the Regents to further their joint enforcement of the ‘443 patent family, is ongoing. Eolas has also continued patent prosecution activities conducted by its patent counsel from California to facilitate its enforcement of the ‘443 patent family, including the ‘507 patent. In light of all these substantial contacts, Google’s prima facie burden to show the existence of

1 minimum contacts is satisfied. Eolas also fails to carry its heavy burden to show that the exercise
 2 of personal jurisdiction would not be reasonable and fair.

3 Alternatively, Eolas requests that the Court decline jurisdiction under the first-to-file rule
 4 because its infringement action in the Eastern District of Texas accusing Google of infringing the
 5 ‘507 patent (filed just after midnight the same day the ‘507 patent issued) was filed one day before
 6 Google brought this declaratory judgment action. But, contrary to Eolas’ suggestion in its motion,
 7 the first-to-file rule is not mechanically applied and has many exceptions. The Court should, as it
 8 is permitted to do in its discretion, keep this case and not decline jurisdiction based on the first-to-
 9 file rule. Initially, the Eastern District case’s status as the “first-filed” is questionable given that
 10 the cases were filed only a day apart. But even if the Texas case was first-filed, the close
 11 connection of this case to this district, compared to the absence of any meaningful connection to
 12 the Eastern District of Texas, makes this case one in which application of the first-to-file rule is
 13 unwarranted under the convenience factors of 28 U.S.C. § 1404(a).

14 **ISSUES TO BE DECIDED**

15 (1) Whether the threshold requirement that this Court have personal jurisdiction over Eolas
 16 is satisfied; and

17 (2) If so, whether this Court should nevertheless decline to exercise that jurisdiction and
 18 dismiss this action on the basis of the first-to-file rule.¹

19 **SUMMARY OF RELEVANT FACTS**

20 **I. EOLAS HAS EXTENSIVE CONTACTS WITH CALIFORNIA AND FEW 21 CONTACTS WITH TEXAS**

22 **A. Eolas Was Founded in California to Help Commercialize an Alleged Invention 23 Conceived at the University of California, San Francisco**

24 Eolas began as a California company in 1994 to help commercialize an alleged invention
 25 by Michael Doyle, David Martin, and Cheong Ang related to providing interactive content
 26

27 ¹ Eolas’ statement of the issues posits whether the Court should “dismiss, stay, or transfer this
 28 action” under the first-to-file rule (Dkt. 37, 1), but Eolas’ motion focuses solely on dismissal and
 provides no argument or support for a transfer or stay.

1 embedded in web pages, as described in the ‘443 application. (Exs. 1-2.²) The inventors allegedly
 2 conceived this invention while working at the University of California, San Francisco. (Dkt. 37-3
 3 ¶¶ 1-6.) Thus, the ‘443 patent application was originally assigned to the Regents, the legal entity
 4 domiciled in Oakland, California in charge of the University of California system. (Ex. 7.) Two
 5 of three inventors, Martin and Ang, still reside in this district. (Exs. 3-6.) Even today, Eolas’
 6 patent enforcement activities, including the infringement action it brought against Google in the
 7 Eastern District of Texas, *Eolas Technologies Incorporated v. Google Inc.*, No. 6:15-cv-1039
 8 (E.D. Tex.) (“the Texas action”), place the California invention story front and center. (*See, e.g.*,
 9 Dkt. 37-3 ¶¶ 1-6.)

10 **B. Throughout Its Existence, Eolas Has Been Subject to Numerous Continuing**
 11 **Obligations Imposed on It by Agreements with the Regents**

12 In 1995, then California-based Eolas entered into an exclusive patent license agreement
 13 whereby the Regents granted an exclusive license to Eolas to the ‘443 application and “any
 14 reissues, extensions, substitutions, continuations, divisions and continuations-in-part” related to
 15 that application (*i.e.*, to the ‘443 patent family). (Ex. 8, 6.) The exclusive patent license
 16 agreement between Eolas and continuous California resident the Regents remained in force, as
 17 amended and restated over time, for over 20 years, until one month before Google’s filing of this
 18 case. (Dkt. 37-5; Ex. 8 (referred to as the “Exclusive License Agreement”).) The Exclusive
 19 License Agreement imposed many continuing obligations on Eolas, some of which survive the
 20 termination of that agreement. (*Id.*, 16 (Articles 7, 11, 12, 13, 16, and 25 survive termination of
 21 the agreement).) These obligations include:

- 22 • Payment of a “minimum annual royalty” to the Regents in “further consideration
 23 for all the rights and licenses granted” and quarterly payments of royalties from any
 24 sub-license Eolas obtains (*id.*, 11-13 (Article 4));
- 25 • Due diligence obligations, including obligations for Eolas to obtain net receipts and
 26 to maintain its license with the Regents, with the Regents retaining the right to
 27 terminate the license if Eolas does not sufficiently meet its obligations under the
 license agreement (*id.*, 14 (Article 5));
- Providing the Regents “with quarterly royalty reports” (*id.*, 14-15 (Article 6));

28 ² Exhibit citations refer to the exhibits attached to the concurrently filed declaration of Felipe Corredor in Support of Google’s Opposition to Eolas’ Motion to Dismiss.

- 1 • Keeping accurate books and records accounting for “all royalties that are due” and
2 maintaining “sufficient supporting documentation to substantiate the accuracy” of
3 the royalties due to the Regents, and making these books and records available for
4 inspection by the Regents in order for the Regents to assess and determine Eolas’
5 compliance with the license agreement (*id.*, 15 (Article 7));
- 6 • Diligent prosecution and maintenance of the ‘443 patent family at Eolas’ own
7 expense, selecting prosecution counsel only with the Regents’ consent (*id.*, 18-19
8 (Article 12));
- 9 • Assuming the defense of the Regents, including all costs and expenses, in the event
10 that “any action” by Eolas causes the Regents to be named as a defendant in a
11 declaratory judgment action; keeping the Regents “reasonably apprised” of the
12 status of any litigation involving the ‘443 patent family; payment of 24% of any
13 monetary damages and 50% of any enhanced damages awarded for a finding of
14 infringement of the ‘443 patent family; notifying the Regents of an intent to sue
15 before filing any suit against any alleged infringer (*id.*, 21-22 (Article 15)); and
- 16 • Indemnification obligations (*id.*, 22-24 (Article 16)).

17 Additionally, the Exclusive License Agreement includes a choice-of-law provision selecting
18 California law. (*Id.*, 26.)

19 On October 9, 2015, just over a month prior to the issuance of the ‘507 patent and this
20 lawsuit, Eolas entered into a patent assignment agreement with the Regents (the “Patent
21 Assignment Agreement”) that assigned the ‘443 patent family to Eolas and terminated the
22 Exclusive License Agreement. (Dkt. 37-5, 1, 3-4, 16-17.) Like the Exclusive License Agreement,
23 however, the Patent Assignment Agreement imposed numerous continuing obligations on Eolas:

- 24 • Payment of the Regents’ expenses incurred in collaborating with Eolas with respect
25 to patent enforcement, patent prosecution, and perfecting the patent assignment (*id.*,
26 5-6 (Article 4));
- 27 • Paying the Regents a 5% ongoing royalty as the “purchase price” for the ‘443
28 patent family (*id.*, 6-7 (Article 5));
- Due diligence obligations, specifically including an obligation to “use reasonable
efforts to enter into License Agreements” (*id.*, 7 (Article 6));
- Providing quarterly reports of amounts payable to the Regents (*id.*, 7 (Article 7);
see id., 6);
- The same bookkeeping and recordkeeping obligations as under Article 7 of the
Exclusive License Agreement (*id.*, 7 (Article 8); *see Ex. 8, 15*);

- 1 • Many of the same Eolas obligations with respect to joint enforcement or defense of
2 patent infringement actions as under Article 15 of the Exclusive License
3 Agreement, including an obligation to pay the Regents' costs and expenses and to
4 notify the Regents prior to filing any infringement action (Dkt. 37-5, 10-11 (Article
5 12); *see* Ex. 8, 21-22); and
- 6 • Some of the same indemnification obligations outlined in the Exclusive License
7 Agreement (Dkt. 37-5, 11 (Article 13); *see* Ex. 8, 22-24).

8 Finally, like the Exclusive License Agreement, the Patent Assignment Agreement selects
9 California law as the governing law. (Dkt. 37-5, 12.)

10 On February 5, 2016, one business day before Eolas filed the instant motion to dismiss,
11 over two months after Google filed this action, Eolas and the Regents executed an amendment to
12 the Patent Assignment Agreement, which purports to delete several provisions in the Patent
13 Assignment Agreement, including the due diligence provisions in Article 6 and the reporting
14 requirements in Article 7, as well as the choice-of-law provision. (Dkt. 37-6; *see* Dkt. 37-5, 7,
15 12.) It also amends Article 4 by rephrasing the cooperation and expense repayment obligation
16 provisions from mandatory to conditional. (Dkt. 37-6; *see* Dkt. 37-5, 5-6.) The amendment did
17 not affect the remaining obligations imposed under the Patent Assignment Agreement outlined
18 above.

19 **C. Eolas Has Directed Numerous Patent Enforcement Activities into California**

20 As contemplated by the longstanding contractual relationship between Eolas and the
21 Regents, Eolas has used the '443 patent family in a patent enforcement campaign, which began in
22 the 1990s when it was still incorporated in California. These extensive enforcement efforts have
23 included both threats of litigation as well as litigation against numerous California-based
24 companies. All of these efforts stem from patents prosecuted by Eolas' California-based patent
25 prosecution counsel, Charles E. Krueger. Mr. Krueger started prosecuting the '433 patent
26 application (which became U.S. Patent No. 5,838,906 ("the '906 patent")) in 1996 (Ex. 9, 20) and
27 prosecuted continuation applications thereto continuously through the issuance of the asserted
28 '507 patent (Ex. 10).

In 1999, Eolas sued Microsoft Corp. in the Northern District of Illinois for infringement of
the '906 patent. *Eolas Techs. Inc. v. Microsoft Corp.* ("Eolas v. Microsoft"), 399 F.3d 1325, 1328

1 (Fed. Cir. 2005). During the pendency of that case, Eolas availed itself of the benefit of this forum
2 by bringing, in this Court, a motion to compel discovery from a third-party prior artist resident in
3 this district, Pei-Yuan Wei. (Ex. 11.) Mr. Wei figured prominently at the 2003 trial in that case
4 and his live testimony formed the basis for the Federal Circuit’s reversal of the district court’s
5 judgment that the ‘906 patent was not invalid. *Eolas v. Microsoft*, 399 F.3d at 1328-29, 1332-35.

6 Beginning in 2009, Eolas shifted its litigation efforts to the Eastern District of Texas,
7 accusing multiple California-based companies of infringing patents in the ‘443 patent family,
8 including the ‘906 patent and related patents issued from continuation applications claiming
9 priority to the same ‘443 application as the ‘906 patent—U.S. Patent Nos. 7,599,985 (“the ‘985
10 patent”), 8,082,293 (“the ‘293 patent”), and 8,086,662 (“the ‘662 patent”). Companies sued for
11 infringement of the ‘443 patent family include California-based companies such as Google itself
12 and Adobe Systems Inc., Apple Inc., eBay Inc., Facebook Inc., Sun Microsystems Inc., The Walt
13 Disney Company, and Yahoo! Inc. (Dkt. 27 ¶ 11.) Many of these California companies settled
14 and entered into license agreements with Eolas, including Adobe Systems, Apple, eBay, and
15 Oracle/Sun Microsystems. (*Id.*)

16 Google and a few other defendants litigated the 2009 case, *Eolas Technologies Inc. v.*
17 *Google Inc. et al.* (“*Eolas I*”), No. 6:09-cv-446 (E.D. Tex.), through a 2012 trial to a final
18 judgment of invalidity of many of the claims of the ‘906 and ‘985 patents. (Ex. 12.) Eolas
19 received assistance from many California residents during that 2012 trial, especially from the two
20 ‘443 patent family inventors who still reside in this district, are shareholders in Eolas, and were
21 (and may still be) Eolas’ consultants. (Ex. 13.) Eolas also received the benefit of testimony from
22 California resident William Tucker, an employee of the Regents who testified at the 2012 trial.
23 (Ex. 14.) Moreover, Eolas engaged a California-based damages expert, Roy Weinstein, who
24 would have testified had the trial proceeded to damages. (Exs. 15-16.)

25 In December 2013, Eolas accused Google of infringing the ‘293 and ‘662 patents in a letter
26 sent to Google in California. (Dkt. 37, 12.) In response, Google brought a declaratory judgment
27 action in this district. Eolas moved to dismiss that action for lack of personal jurisdiction. This
28 Court denied Eolas’ motion, finding that Eolas was properly subject to the personal jurisdiction of

1 this Court. *Google, Inc. v. Eolas Techs. Inc.* (“*Eolas II DJ*”), No. 13-cv-5997, 2014 WL 2916621
 2 (N.D. Cal. June 24, 2014). The Court reasoned that Eolas maintained minimum contacts with
 3 California in the form of its “continuing obligations to the Regents under the licensing
 4 agreement,” the 2013 letter sent to Google in California, Eolas’ selection of California law in its
 5 agreement with the Regents, Eolas’ creation and initial incorporation in California, and the length
 6 of time Eolas had been subject to its agreement with the Regents. *Id.* at *3. The Court also found
 7 that those contacts made “the exercise of specific jurisdiction reasonable and fair.” *Id.* at *4.
 8 Eolas then affirmatively availed itself of the jurisdiction of this Court by asserting infringement
 9 counterclaims in *Eolas II DJ*. (Ex. 17.)

10 The latest chapter in Eolas’ litigation campaign are the infringement allegations that gave
 11 rise to this lawsuit. Just after midnight on November 24, 2015, the same day the ‘507 patent
 12 issued, Eolas brought the Texas action against Google.³ On November 25, 2015, Google brought
 13 the instant action, its second declaratory judgment action against members of the ‘443 patent
 14 family, seeking a declaratory judgment of non-infringement of the ‘507 patent.

15 **D. Eolas Has Few Meaningful Contacts with Texas**

16 Eolas embraces Texas as its home, claiming that its “Texas roots are extensive, substantial
 17 and long-lasting.” (Dkt. 37, 3.) But Eolas’ California roots, outlined above, tell a different story.
 18 (Dkt. 37-3 ¶¶ 1-6.) Eolas has been a Texas corporation only since 2009, a mere three months
 19 before it sued over 20 companies for infringement of the ‘443 patent family in the Eastern District
 20 of Texas. (Dkt. 37-1 ¶ 3.) Eolas’ two officers, Chief Technology Officer (and inventor) Michael
 21 Doyle and Chief Executive Officer and General Counsel Mark Swords, are longtime Illinois
 22 residents. (*Id.* ¶ 2.) Mr. Swords only relocated to Tyler, Texas in November 2015. Then, in
 23 December 2015, Assistant General Counsel James Stetson, who had moved to Tyler just three
 24 months prior to *Eolas I*, relocated out of Texas. (*Id.*; Ex. 18 ¶¶ 2, 9.) Neither Swords nor Stetson
 25 testified at the 2012 trial in *Eolas I*. (Corredor Decl. ¶ 4.)

26
 27
 28 ³ In companion cases filed the same day, Eolas also sued Amazon.com, Inc. and Wal-Mart
 Stores, Inc. for infringement of the ‘507 patent.

Moreover, when asked in January 2016 whether “Eolas Technologies had an office in the building,” an occupant of the house in which Eolas’ Tyler office is located stated that “Jim Stetson leases an office here—but he doesn’t come in very often by any stretch of the imagination.”⁴ (Ex. 19 ¶¶ 3-4.)

II. GOOGLE’S HOME IS IN THE NORTHERN DISTRICT OF CALIFORNIA, AND LIKELY WITNESSES IN THIS CASE ARE LOCATED HERE

Google’s headquarters have been continuously located in this district since Google’s founding in 1998. (Ex. 21 ¶ 7.) Google seeks a declaratory judgment that its “search results and suggestions” products, accused by Eolas of infringement in the Texas action, do not infringe the ‘507 patent. (Dkt. 27 ¶¶ 38, 40.) Google develops and operates Google Search predominantly at its headquarters in Mountain View, California. (Ex. 21 ¶ 10.) Key employees who work on Google’s accused products work there, including key engineers involved in developing the accused features. (*Id.* ¶¶ 11-12.) These employees include: Searchbox team manager [REDACTED] and product manager [REDACTED]; members of the Chrome UI team, including Senior Software Engineer [REDACTED]; and members of the Search UI Team, including Software Engineer [REDACTED]. (*Id.*) Most employees with knowledge of the accused products’ marketing, including [REDACTED], Group Product Marketing Manager for Search, also work in Mountain View. (*Id.* ¶ 13.) In contrast, Google has no offices in the Eastern District of Texas and is not aware of any employees with relevant knowledge working there or in Texas.⁵ (*Id.* ¶¶ 15-16.)

Similarly, the vast majority of Google’s documents and records related to its search suggestion and filtering products are hosted in secure servers managed from its Mountain View

⁴ In opposing transfer, Eolas argued that its office neighbor’s response should be disregarded “because Stetson had moved to Wisconsin, and Swords now runs the office.” (Ex. 20, 3.) But, as made clear in Google’s declaration, the question asked of the occupant was simply whether “Eolas Technologies had an office in the building.” (Dkt. 21-2 ¶ 4.) It was the occupant who equated Eolas with Mr. Stetson, without mentioning anyone else. It therefore stands to reason that Mr. Swords similarly didn’t “come in [to Eolas’ office] very often by any stretch of the imagination,” during the period between November 2015 and January 2016.

⁵ In Eolas’ opposition to Google’s motion to transfer the Texas action to this district, Eolas contends its Eastern District complaint also implicates unspecified functionality in “Docs, Drive, Maps, Mail, and Ads.” (Ex. 20, 5.) But none of these products are mentioned in the complaint. And, since Google has its headquarters in this district and has no facilities in the Eastern District, more witnesses will be here no matter what products are accused. (Ex. 21 ¶¶ 7, 16.)

1 offices. (*Id.* ¶ 17.) Further, given that most of the employees with relevant knowledge of the
2 accused Google search products are based in Mountain View, any hard copies of documents and
3 employee notebooks that might exist would likely be located there. (*Id.*)

4 **III. NUMEROUS THIRD PARTIES RELEVANT TO THIS CASE RESIDE IN THE**
5 **NORTHERN DISTRICT OF CALIFORNIA, WHILE NONE RESIDE IN THE**
6 **EASTERN DISTRICT OF TEXAS**

7 Given the common specification and similarities between the different patents in the ‘443
8 patent family, including the ‘507 patent, the 2012 trial in *Eolas I* provides a good idea of third-
9 party prior artists likely to be relevant in this case, if Eolas counterclaims for infringement, as it
10 said it would do if its motion is denied (Dkt. 47, 3-4), and Google asserts a defense of invalidity as
11 it successfully did in the 2012 trial. Several prior art web browsers were designed, developed, or
12 commercialized in this district and, accordingly, key sources of proof are likely located here.

13 For example, the ViolaWWW web browser was developed by Northern District resident
14 Pei-Yuan Wei in this district and was critical to the question of validity of related patents in the
15 prior trials in *Eolas I* and *Eolas v. Microsoft*. See, e.g., *Eolas v. Microsoft*, 399 F.3d at 1329,
16 1334-35. Mr. Wei testified at both trials. *Id.* (See also Ex. 23.) Mr. Wei demonstrated the
17 browser’s capability of embedding interactive objects on multiple occasions in 1993, including to
18 two engineers from Sun Microsystems, Karl Jacob and James Kempf (*id.*, 13:24-14:6, 76:11-
19 77:14, 78:8-79:4, 102:21-103:15), and to Tim Berners-Lee and Dale Dougherty (who hired Wei to
20 work on ViolaWWW, *id.*, 72:6-13) and others at the July 1993 “World-Wide Web Wizards
21 Workshop” (Ex. 24.) Mssrs. Jacob, Kempf, and Dougherty are all residents of this district. (Exs.
22 25-30.) Marc Andreessen, the co-developer of NCSA Mosaic, a key prior art web browser
23 discussed in the ‘507 patent (Exs. 10, 31), also attended the World-Wide Web Wizards Workshop
24 (Ex. 23, 82:5-25). Mr. Andreessen resides in Palo Alto, California. (Exs. 32-33.) No Texas-
25 based prior artist testified at the 2012 trial in *Eolas I*. (Corredor Decl. ¶ 4.)
26
27
28

ARGUMENT

I. THIS COURT HAS PERSONAL JURISDICTION OVER EOLAS

A. Legal Standard

There are two requirements for a Court’s exercise of personal jurisdiction: a statute must authorize that exercise and such an exercise must comport with due process. *Daimler AG v. Bauman*, 134 S. Ct. 746, 753 (2014). Federal Rule of Civil Procedure 4(k)(1)(A) instructs federal courts to follow the forum state’s long-arm statute. In California, courts may exercise personal jurisdiction “on any basis not inconsistent with the Constitution of this state or of the United States.” Cal. Civ. Proc. Code § 410.10. Accordingly, the personal jurisdiction analysis collapses into the due process inquiry.

Under the Due Process Clause, the “constitutional touchstone” for personal jurisdiction is “whether the defendant purposefully established ‘minimum contacts’ in the forum State.” *Burger King Corp. v. Rudzewicz*, 471 U.S. 462, 474 (1985) (quoting *Int’l Shoe Co. v. Washington*, 326 U.S. 310, 316 (1945)). There are two types of personal jurisdiction: general and specific. *Daimler*, 134 S. Ct. at 754. General jurisdiction requires “continuous and systematic” contacts that render the defendant essentially at home in the forum state. *Id.* Specific jurisdiction, however, “exists where the cause of action arises out of or relates to a defendant’s contacts with the forum state, even if those contacts are isolated and sporadic.” *ASUSTeK Computer Inc. v. AFTG-TG LLC*, No. 5:CV11-0192, 2011 WL 6845791, at *5 (N.D. Cal. Dec. 29, 2011) (citing *Trintec Indus., Inc. v. Pedre Promotional Prods., Inc.*, 395 F.3d 1275, 1279 (Fed. Cir. 2005)). Federal Circuit law applies to a district court’s determination of personal jurisdiction where a patent question exists. *Celguard, LLC v. SK Innovation Co.*, 792 F.3d 1373, 1377 (Fed. Cir. 2015). The Federal Circuit applies the following three-part test to determine if specific jurisdiction exists: “(1) whether the defendant purposefully directed its activities at residents of the forum state, (2) whether the claim arises out of or relates to the defendant’s activities with the forum state, and (3) whether assertion of personal jurisdiction is reasonable and fair.” *Id.* “The first two factors correspond with the ‘minimum contacts’ prong of *International Shoe*, and the

1 third factor corresponds with the ‘fair play and substantial justice’ prong of the analysis.” *Id.* at
 2 1378 (quoting *Inamed Corp. v. Kuzmak*, 249 F.3d 1356, 1360 (Fed. Cir. 2001)).

3 District courts must construe all pleadings and affidavits “in the light most favorable to
 4 [plaintiff]” and “must accept the uncontroverted allegations in the plaintiff’s complaint as true and
 5 resolve any factual conflicts in the affidavits in the plaintiff’s favor.” *Avocent Huntsville Corp. v.*
 6 *Aten Int’l Co.*, 552 F.3d 1324, 1329 (Fed. Cir. 2008) (quoting *Silent Drive, Inc. v. Strong Indus.,*
 7 *Inc.*, 326 F.3d 1194, 1201 (Fed. Cir. 2003); *Elecs. for Imaging, Inc. v. Coyle*, 340 F.3d 1344, 1349
 8 (Fed. Cir. 2003)). While the plaintiff bears the burden of demonstrating the first two prongs (i.e.,
 9 that minimum contacts exist), a plaintiff’s burden with respect to the first two prongs is only a
 10 prima facie burden. *Avocent*, 552 F.3d at 1329. The defendant then bears the burden of
 11 disproving that the exercise of jurisdiction is reasonable and fair. *See id.* at 1331. This burden is a
 12 heavy one. *Inamed*, 249 F.3d at 1363-64.

13 **B. Eolas Has the Minimum Contacts with California Required for This Court’s**
 14 **Exercise of Specific Jurisdiction**

15 **1. Eolas’ Affiliation with the Regents Supports Personal Jurisdiction**

16 This litigation stems from Eolas’ contacts with California dating back to 1994, when the
 17 invention that led to the ‘507 patent was conceived in California, which ultimately led rise to the
 18 cause of action asserted by Google here. Whether one considers the longstanding, but recently
 19 terminated Exclusive License Agreement, the newly minted Patent Assignment Agreement, or the
 20 post-filing amendment to the Patent Assignment Agreement, these contacts are more than
 21 sufficient to provide this Court with specific jurisdiction over Eolas.

22 **(a) Eolas’ Contacts with the Regents in California Are Longstanding**
and Predate the Filing of This Action

23 This Court found, less than two years ago, that it could exercise personal jurisdiction over
 24 Eolas consistent with constitutional due process. *Eolas II DJ*, 2014 WL 2916621. Though Eolas
 25 now relies on a change in the nature of Eolas’ agreement with the Regents to try and distinguish
 26 this Court’s prior reasoned opinion, in actuality, not much has changed since then.

27 Eolas is still the same company, a company with a long history of directing patent
 28 enforcement activities toward California based on its longstanding contacts in California. Eolas

1 was founded in California in 1994 and was incorporated here until 1999. (Dkt. 37-1 ¶ 3.) Since
 2 then, it has relocated twice, reincorporating in its current form as a Texas corporation in 2009 (*id.*),
 3 shortly before bringing suit against Google and other defendants in Texas. (Dkt. 37-7).

4 Notwithstanding Eolas' alleged Texas ties, Eolas' own complaint in the co-pending infringement
 5 case against Google in Texas places front and center Eolas and its founder Michael Doyle's roots
 6 at the University of California, San Francisco. (Dkt. 37-3 ¶¶ 1-6.)

7 At the center of Eolas' California-based story is the alleged invention that resulted in the
 8 '443 patent family. Since 1994, Eolas and the Regents, a California resident, have had a close
 9 relationship centered around enforcement of the '443 patent family. Indeed, Eolas' own website
 10 acknowledges that Eolas was founded "[t]o assist the University of California in commercializing
 11 the '906 patent" (the first of the '443 patent family). (Ex. 2.) In 1995, shortly after the alleged
 12 invention, Eolas and the Regents negotiated and entered into an exclusive license agreement,
 13 which remained in effect in amended and restated form until just one month prior to the filing of
 14 this lawsuit. (Ex. 8.) The agreement covered the '443 patent family. (*Id.*, 3.) Both Eolas and the
 15 Regents benefitted from the partnership embodied by the Exclusive License Agreement. For
 16 twenty years, Eolas maintained its license with the Regents, complying with numerous obligations
 17 and sharing licensing revenues with the Regents. Extending and reinforcing Eolas' longstanding
 18 affiliation with the Regents in California, Eolas also purposefully chose to enter into the Patent
 19 Assignment Agreement (which terminated the Exclusive License Agreement) just one month
 20 before the filing of this lawsuit. (Dkt. 37-5.)

21 Eolas' affiliation with the Regents, as embodied in these agreements, reflects the minimum
 22 contacts this Court previously found Eolas had with California. *Eolas II DJ*, 2014 WL 2916621,
 23 at *2-4. First, as described above in Summary of Relevant Facts Section I.B, the Exclusive
 24 License Agreement created numerous obligations between Eolas and the Regents, and thus,
 25 contacts with this forum, including: joint prosecution and defense of patent-related actions;
 26 indemnification of the Regents; regular recordkeeping, bookkeeping, accounting, and reporting to
 27 the Regents for patent-related activities; the payment of patent royalties to the Regents; and a duty
 28 of due diligence in all patent-related activities. *Eolas II DJ*, 2014 WL 2916621, at *2-3 (citing

1 *Breckenridge Pharm., Inc. v. Metabolite Labs., Inc.*, 444 F.3d 1356 (Fed. Cir. 2006); *Silent Drive,*
 2 *Inc. v. Strong Indus., Inc.*, 326 F.3d 1194 (Fed. Cir. 2003); *Akro Corp. v. Luker*, 45 F.3d 1541
 3 (Fed. Cir. 1995)). (See Ex. 8, 8, 11-15, 18-19, 21-24.) Second, the agreement specified California
 4 law in its choice-of-law provision, further cementing Eolas' 20-year-long affiliation with a
 5 California resident (the Regents), and thus creating a reasonable possibility of litigation arising out
 6 of the patent enforcement activities, including activities purposefully directed at California
 7 companies, at the center of that affiliation. *Id.* at *3 (citing *Burger King*, 471 U.S. at 481-82).
 8 (See Ex. 8, 26.) Third, Eolas was created and incorporated in California for five years. *Eolas II*
 9 *DJ*, 2014 WL 2916621, at *3. Fourth, Eolas entered into the Exclusive License Agreement with
 10 the Regents in California. *Id.* Fifth, Eolas engaged in patent-related activities in California before
 11 relocating to Texas. *Id.* Sixth, Eolas and the Regents have been subject to the Exclusive License
 12 Agreement for a long period of time—over 20 years. *Id.*

13 Though not all of these findings squarely apply to the Patent Assignment Agreement, they
 14 are still relevant, as the '507 patent and the '443 patent family were largely prosecuted while the
 15 Exclusive License Agreement was still in effect. Without those efforts, the patent could not have
 16 issued. Also, several of the provisions of the Exclusive License Agreement survive termination of
 17 that agreement (Ex. 8, 16), including provisions crucial to this Court's prior holding that Eolas
 18 maintains sufficient contacts with California, *Eolas II DJ*, 2014 WL 2916621, at *3. This includes
 19 Article 7, imposing an obligation on Eolas to keep accurate books and records for royalties due to
 20 the Regents (*id.*, 15), Article 12, imposing patent prosecution and maintenance obligations on
 21 Eolas (*id.*, 18-19), and Article 16, imposing indemnification obligations on Eolas (*id.*, 22-24).

22 In addition, the Patent Assignment Agreement contains, in nearly identical form, several of
 23 the provisions previously relied on by this Court to find personal jurisdiction. See *Eolas II DJ*,
 24 2014 WL 2916621, at *3. Obligations related to payment of ongoing royalties subsist, as the
 25 "purchase price" for the '443 patent family is an ongoing royalty of 5% of net revenues earned by
 26 Eolas from the '443 patent family. (Dkt. 37-5, 6.) Due diligence obligations also subsist. (*Id.*, 7.)
 27 Eolas is also still required to provide reports to the Regents on a quarterly basis. (*Id.*) The
 28 agreement restates and reimposes obligations related to the joint defense or assertion of patent-

1 related actions. (*Id.*, 10-11; *see also id.*, 5 (requiring cooperation between Eolas and the Regents
 2 with respect to, among others, document discovery–related activities, to be paid for by Eolas).)
 3 Finally, the agreement selects California law as the governing law. (*Id.*, 12.)

4 In brief, the Patent Assignment Agreement reflects essentially the same substantive
 5 contacts with California on which the Court previously relied to determine that personal
 6 jurisdiction over Eolas exists. *Eolas II DJ*, 2014 WL 2916621, at *2-4. Accordingly, the Court’s
 7 inquiry could end here: for the same reasons as in the prior case, the minimum contacts analysis is
 8 satisfied.

9 (b) The Post-Filing Amendment to the Patent Assignment Agreement
 10 Shows Eolas and the Regents’ Relationship Is Ongoing

11 One business day before the filing of its motion to dismiss, Eolas executed a first
 12 amendment to its Patent Assignment Agreement with the Regents. (Dkt. 37-6.) This apparent
 13 effort to avoid this Court’s exercise of personal jurisdiction fails.

14 As a matter of law, the amendment has no effect on the minimum contacts analysis. It is
 15 widely accepted by federal courts that, “for purposes of specific jurisdiction, contacts should be
 16 judged when the cause of action arose, regardless of a later lessening or withdrawal.” *Cambridge*
 17 *Literary Props., Ltd. v. W. Goebel Porzellanfabrik G.m.b.H.*, 295 F.3d 59, 66 (1st Cir. 2002); *see*
 18 *also, e.g., Farmers Ins. Exch. v. Portage La Prairie Mut. Ins. Co.*, 907 F.2d 911, 913 (9th Cir.
 19 1990) (“Only contacts occurring prior to the event causing litigation may be considered.”);
 20 *Asarco, Inc. v. Glenara, Ltd.*, 912 F.2d 784, 787 n.1 (5th Cir. 1990) (holding, with respect to
 21 specific jurisdiction, that “the relevant time for determining jurisdiction is the filing of the
 22 complaint”); *cf. Grupo Dataflux v. Atlas Global Grp., L.P.*, 541 U.S. 567, 570-71 (2004) (“It has
 23 long been the case that ‘the jurisdiction of the court depends upon the state of things at the time of
 24 the action brought.’ This time-of-filing rule is hornbook law (quite literally) taught to first-year
 25 law students in any basic course on federal civil procedure.” (quoting *Mollan v. Torrance*, 9 U.S.
 26 (Wheat.) 537, 539 (1824))). Indeed, because a Court’s jurisdiction is its power to hear a case filed
 27 against a defendant, a jurisdictional analysis cannot take account of facts arising after the filing of
 28 the case-initiating complaint. *Life360, Inc. v. Advanced Ground Information Sys., Inc.*, No. 15-cv-

1 151, 2015 WL 5612008, at *4 n.8 (N.D. Cal. Sept. 21, 2015) (“[T]he Court must disregard
2 evidence relating to HoundDog for purposes of the personal jurisdiction analysis because
3 HoundDog was released after the events giving rise to this action and after the filing of the
4 original complaint and operative FAC. ‘[C]ourts must examine the defendant’s contacts with the
5 forum at the time of the events underlying the dispute when determining whether they have
6 jurisdiction.’” (quoting *Steel v. United States*, 813 F.2d 1545, 1549 (9th Cir. 1987))) Under this
7 well-established case law, the purported amendment to Eolas’ Patent Assignment Agreement with
8 the Regents is irrelevant and need not be considered.

9 Even considering the belated amendment to the Patent Assignment Agreement, it further
10 supports personal jurisdiction as it demonstrates the ongoing relationship with the Regents. First,
11 it shows that Eolas and the Regents continue to negotiate new agreements related to the
12 enforcement of the patent at issue. Eolas also still has significant obligations to California resident
13 the Regents under the amendments, and thereby maintains contacts with California sufficient to
14 support this Court’s exercise of personal jurisdiction. The prosecution and maintenance
15 obligations outlined in the longstanding Exclusive License Agreement survived the termination of
16 that agreement and are unaffected by the amendment to the Patent Assignment Agreement. (Ex. 8,
17 16, 18-19.) The “Books and Records” provision is also unaffected by the amendment and imposes
18 obligations on Eolas to “keep books and records accurately showing all amounts that are due to
19 The Regents,” among others. (Dkt. 37-5, 7; *see* Dkt. 37-6.) And the indemnification obligations
20 imposed on Eolas in the original Patent Assignment Agreement also remain in full force,
21 unaffected by the amendment. (Dkt. 37-5, 11; *see* Dkt. 37-6.) The royalty payment obligations
22 remain untouched as well. (Dkt. 37-5, 6; *see* Dkt. 37-6.) Further, despite the amendment of the
23 document discovery-related paragraph 4.1 to make its language conditional instead of mandatory,
24 Eolas remains subject to significant joint defense and enforcement obligations with respect to the
25 ‘443 patent family, including paying for the Regents’ counsel in litigation-related activities. (Dkt.
26 37-5, 5, 10-11; *see* Dkt. 37-6.) Finally, though the amendment purports to strike the choice-of-law
27 provision selecting California law, given the Regents’ undisputed residence in California and
28 Eolas’ ample contacts with California (Dkt. 37-5, 12, *see* Dkt. 37-6), it is likely that California law

1 is the default for the resolution of any contractual disputes between Eolas and the Regents, *see*,
2 *e.g.*, Restatement (Second) of Conflict of Laws § 188.

3 **2. Eolas’ Activities, Independent of Its Longstanding Relationship to the**
4 **Regents, Are Purposefully Directed Toward This Forum and Further**
5 **Support This Court’s Exercise of Personal Jurisdiction**

6 Even beyond Eolas’ extensive contacts with the Regents, Eolas has purposefully directed
7 additional activities at this forum over the past several years. Eolas was founded and incorporated
8 in California to “license the patents to companies who were making money” using its alleged
9 invention. (Ex. 34, 38:17-21.) Further, Eolas’ lawsuits have been directed against numerous
10 California-based companies, several of whom have taken licenses to the ‘443 patent family. (Dkt.
11 27 ¶ 11.) These enforcement activities all benefit California resident the Regents through Eolas’
12 agreements with the Regents. (Ex. 8, 11-13; Dkt. 37-5, 6.)

13 Additionally, Eolas uses Charles E. Krueger, a California attorney (Ex. 35), to prosecute
14 the ‘443 patent family. Mr. Krueger has been involved in prosecuting patents on behalf of Eolas
15 for nearly 20 years. (Exs. 9-10.) Mr. Krueger’s prosecution activities on behalf of Eolas in
16 California accordingly further Eolas’ patent enforcement objectives in this forum, a contact from
17 which this litigation directly arises.

18 Moreover, the two inventors who remain California residents to this day, Mr. Martin and
19 Mr. Ang, previously assisted Eolas in its patent litigations as consultants, and they maintain a
20 connection to Eolas as shareholders (and potentially still as consultants) with a financial interest in
21 Eolas’ enforcement of its patent rights. (Ex. 13.) Indeed, they both recently submitted
22 declarations in support of Eolas’ current opposition to Google’s motion to transfer the Texas
23 action. (*See* Ex. 20, 11.) Eolas also engaged the services of California resident Roy Weinstein as
24 its damages expert in *Eolas I*. (Exs. 15-16.) The Federal Circuit has upheld personal jurisdiction
25 over patentees who “retained agents in the forum state to assist in the enforcement of its patent
26 rights.” *Radio Sys. Corp. v. Accession, Inc.*, 638 F.3d 785, 791 (Fed. Cir. 2011).

27 Eolas has also availed itself of this Court as a forum for litigation. In both Google’s and
28 J.C. Penney’s prior declaratory judgment cases against patents in the ‘443 patent family, Eolas
purposefully availed itself of the jurisdiction of this Court by asserting counterclaims against

1 Google and J.C. Penney. (Exs. 17, 36.) Eolas also availed itself of this Court by seeking judicial
2 relief to enforce a subpoena to prior artist Pei-Yuan Wei in *Eolas v. Microsoft*. (Ex. 11.)

3 In its motion, Eolas tries to leave the impression that the ‘507 patent is unrelated to Eolas’
4 extensive prior enforcement efforts. As detailed above, that is incorrect. (Dkt. 37-3 ¶¶ 1-6.)
5 Indeed, in opposing Google’s motion to transfer the Texas action, Eolas emphasized the ‘507
6 patent’s relationship with earlier members of the ‘443 patent family asserted against Google. (Ex.
7 20, 3-4.) This relationship between the ‘507 patent and other members of the ‘443 patent family
8 reinforces this case’s connection to Eolas’ “patent-related activities in California before relocating
9 to Texas.” *Eolas II DJ*, 2014 WL 2916621, at *3. This also distinguishes Eolas’ cited case of
10 *Xilinx, Inc. v. Papst Licensing GMBH*, 113 F. Supp. 3d 1027 (N.D. Cal. 2015). In *Xilinx*, the
11 defendant’s prior enforcement activities involved unrelated patents. *Id.* at 1044-45. Here, as
12 shown by Eolas’ own complaint and the face of the ‘507 patent, the “relevant patents” that Eolas
13 has a long history of enforcing in California are the patents in the ‘443 patent family—not just the
14 ‘507 patent. Eolas’ direct and longstanding relationship with the Regents further distinguishes
15 *Xilinx*, where patentee Papst never actually entered into any agreement with any California
16 resident. Rather, it purchased the patents from FTE, a Texas entity who had purchased the patents
17 from the original patent assignee Rambus. *Id.* at 1032. Nor did Papst ever agree to a California
18 choice-of-law provision, opting instead for Texas law. *Id.* at 1042-43. In addition, in *Xilinx*, there
19 was no evidence that Papst had previously enforced the patents-in-suit or any related patents
20 against California entities, as Eolas has done multiple times with the ‘443 patent family, including
21 against Google.

22 3. Eolas Seeks to Elevate Irrelevant Differences Above Its Actual and 23 Substantial Contacts with the Regents, a California Resident

24 For the reasons discussed above, Eolas maintains minimum contacts with California
25 sufficient to justify this Court’s exercise of personal jurisdiction. Nowhere does Eolas’ motion
26 demonstrate a lack of such minimum contacts, instead attempting to chip away at the extensive
27 contacts previously relied on by this Court and those outlined in Google’s complaint. (Dkt. 37,
28

1 10-17.) But none of Eolas’ arguments detract from the existence of minimum contacts with
2 California—contacts from which this action arose.

3 Eolas provides a table that purports to illustrate differences between this case and the prior
4 declaratory judgment action but highlights only irrelevant differences. (Dkt. 37, 10-11.) For
5 example, Eolas highlights the absence of the Regents as a defendant notwithstanding the fact that
6 “[e]ach defendant’s contacts with the forum State must be assessed individually.” *Avocent*, 552
7 F.3d at 1329 (quoting *Calder v. Jones*, 465 U.S. 783, 790 (1984)). Thus, as Eolas has previously
8 argued, the presence or absence of the Regents as a separate defendant is irrelevant to the analysis
9 of whether this Court has personal jurisdiction over Eolas. (Ex. 37, 9.) And, though it is true that
10 the patent at issue in this case (the ‘507 patent) is different than the patents at issue in *Eolas II DJ*
11 (the ‘293 and ‘662 patents), the Exclusive License Agreement and Patent Assignment Agreement
12 make no distinction between sister patents in the ‘443 patent family: all patents deriving from the
13 ‘443 patent application are treated the same. (Ex. 8 ¶ 1.10; Dkt. 37-5 ¶ 1.8.)

14 Eolas also focuses on the fact that Eolas—and not the Regents—now owns the ‘443 patent
15 family and on the formal distinction between the Patent Assignment Agreement and the prior
16 Exclusive License Agreement between Eolas and the Regents. This focus is misplaced. The
17 relevance of the Exclusive License Agreement was in its creation of “continuing obligations”
18 between the parties to the agreement, not in which party owned and which party licensed the ‘443
19 patent family. *Eolas II DJ*, 2014 WL 2916621, at *2. Many of those continuing obligations still
20 exist under the current Patent Assignment Agreement. Moreover, Eolas’ attempts to characterize
21 the Regents as a mere non-exclusive licensee, as if the Regents were in the same position as
22 Adobe Systems or any of the other numerous licensees to the ‘443 patent family, are
23 unconvincing. It is usually the licensee who pays the licensor under a license agreement; yet,
24 under Eolas’ agreement with the Regents, it is the licensor Eolas who pays its “non-exclusive
25 licensee” the Regents. The Regents are much more than just Eolas’ non-exclusive licensee. Eolas
26 also selects and distinguishes cases that focused on exclusive license agreements between a
27 defendant and a forum resident, ignoring the fact that, unlike here, the exclusive license was the
28

1 only agreement at issue in those cases. (Dkt 37, 11 (citing *Breckenridge*, 444 F.3d; *Akro*, 45 F.3d
2 1541).)

3 Eolas also conspicuously fails to address cases this Court previously relied on in finding
4 that Eolas had sufficient minimum contacts with California. *Eolas II DJ*, 2014 WL 2916621, at
5 *2. For example, *Silent Drive, Inc. v. Strong Industries, Inc.*, 326 F.3d 1194 (Fed. Cir. 2003),
6 makes clear that contacts sufficient to justify an exercise of personal jurisdiction include any
7 “‘other activities’ directed at the forum and related to the cause of action.” *Id.* at 1202; *Avocent*,
8 552 F.3d at 1334 (“Examples of these ‘other activities’ include . . . entering into an exclusive
9 license agreement or other undertaking which imposes enforcement obligations with a party
10 residing or regularly doing business in the forum.” (emphasis added)). The Patent Assignment
11 Agreement, though different in nature from the Exclusive License Agreement previously relied on
12 by this Court to find personal jurisdiction, is precisely such an activity directed at California—an
13 “undertaking which imposes enforcement obligations with a party residing or regularly doing
14 business in the forum.” *Id.*

15 Finally, the 2013 letter, though focused on other members of the ‘443 patent family,
16 remains one of Eolas’ many relevant contacts with California. In any event, this Court has already
17 found that this letter is “not dispositive.” *Eolas II DJ*, 2014 WL 2916621, at *3 n.2. No such
18 letter had been directed to California with respect to J.C. Penney, the other declaratory judgment
19 plaintiff in the prior litigation, but the Court nevertheless found sufficient contacts to justify
20 exercise of personal jurisdiction with respect to J.C. Penney’s lawsuit. *Id.*

21 **C. The Exercise of Personal Jurisdiction Over Eolas Is Reasonable and Fair**

22 The last prong of personal jurisdiction asks “whether assertion of personal jurisdiction is
23 ‘reasonable and fair.’” *E.g., Inamed*, 249 F.3d at 1360. Eolas devotes its discussion of personal
24 jurisdiction in its motion to explaining how general jurisdiction is lacking and how “Eolas’ limited
25 contacts with California are insufficient to confer specific jurisdiction in this case.” (Dkt. 37, 6-
26 17.) By failing to carry its heavy burden, Eolas appears to concede that, if this Court concludes
27 that Eolas has the requisite minimum contacts with California (as it did less than two years ago),
28 the Court’s exercise of personal jurisdiction over Eolas would be “reasonable and fair.” *Inamed*,

249 F.3d at 1363 (“Where a defendant who purposefully has directed his activities at forum residents seeks to defeat jurisdiction, he must present a compelling case that the presence of some other considerations would render jurisdiction unreasonable.”).

In light of the ample contacts Eolas has with California, as described above and as discussed in the Court’s prior opinion on the issue, it is “reasonable and fair” for this Court to exercise personal jurisdiction over Eolas. *Eolas II DJ*, 2014 WL 2916621, at *4. Eolas’ longstanding relationship with and significant obligations to the Regents (a California resident), its patent commercialization, licensing, and enforcement efforts purposefully directed at California, its prosecution activities conducted from California, the centrality of its California invention story to its infringement allegations, and its continuing relationship with two inventors who are still California residents all make the exercise of specific personal jurisdiction reasonable and fair. Eolas’ failure to carry this heavy burden by failing to present any argument with respect to this prong of the jurisdictional analysis means that the exercise of personal jurisdiction turns only on the minimum contacts analysis.

II. THIS COURT SHOULD NOT DECLINE TO EXERCISE DECLARATORY JUDGMENT JURISDICTION

A. Legal Standard

Eolas’ motion assumes that dismissal of this case is automatic once the threshold requirements of the first-to-file rule—the chronology of the two actions, the similarity of the parties, and the similarity of the issues—are satisfied. But that is incorrect. The Federal Circuit, whose law applies to the application of this doctrine, has repeatedly stated that “there are exceptions and the rule is not rigidly or mechanically applied.” *Meril Ltd. v. Cipla Ltd.*, 681 F.3d 1283, 1299 (Fed. Cir. 2012); *Elecs. for Imaging, Inc. v. Coyle*, 394 F.3d 1341, 1345-47 (Fed. Cir. 2005). Indeed, “[t]he trial courts have discretion to make exceptions to this general [first-to-file] rule in the interest of justice or expediency, as in any issue of choice of forum.” *Micron Tech., Inc. v. Mosaid Techs., Inc.*, 518 F.3d 897, 904 (Fed. Cir. 2008). Such “exceptions are not rare” and are guided by the convenience factors under 28 U.S.C. § 1404(a). *Id.* “[R]obust consideration of these factors will reduce the incentives for a race to the courthouse because both parties will

1 realize that the case will be heard or transferred to the most convenient or suitable forum.” *Id.* at
2 905. Accordingly, “circumstances under which an exception to the first-to-file rule typically will
3 be made include . . . forum shopping.” *Alltrade, Inc. v. Uniweld Prods., Inc.*, 946 F.2d 622, 628
4 (9th Cir. 1991).

5 **B. The Threshold Requirements of the First-to-File Rule Are Not Satisfied**

6 Though the parties and the issues are similar here and in the Texas action, courts may
7 decline “to apply the [first-to-file] rule where the time between the actions is relatively short,”
8 such as one or two days. *EMC Corp. v. Bright Response, LLC*, No. C-12-2841, 2012 WL
9 4097707, at *2 & n.1 (N.D. Cal. Sept. 17, 2012); *see also, e.g., Recoton Corp. v. Allsop, Inc.*, 999
10 F. Supp. 574, 576-77 (S.D.N.Y. 1998) (declining to apply first-to-file rule in light of “the minimal
11 difference in time between the filing of the two actions [two days],” holding that “[t]he importance
12 of the earlier date of filing is diminished where, as here, the competing actions are filed within a
13 short period of time of each other”). This case was filed on November 25, 2016—a single day
14 after Eolas initiated the Texas action by filing its complaint soon after midnight the day the ‘507
15 patent issued. This fact distinguishes this case from, for example, *EMC*, where 27 days separated
16 the infringement action from the declaratory judgment action and the first-to-file rule therefore
17 applied. 2012 WL 4097707, at *2. It also reinforces that Eolas’ filing of its complaint in the
18 Texas action is the type of disfavored race to the courthouse that should not be accepted. *Lonza*
19 *Inc. v. Rohm & Haas, Inc.*, 951 F. Supp. 46, 50 (S.D.N.Y. 1997) (dismissing the first-filed suit in
20 favor of a suit filed shortly thereafter in a more convenient forum based in part on “the unseemly
21 race to the court house”).

22 **C. The Forum-Shopping Exception to the First-to-File Rule Applies**

23 Even if the threshold requirements to the first-to-file were satisfied, the Court should
24 exercise discretion, considering the convenience factors derived from § 1404(a), to retain this case
25 under the forum-shopping exception. The convenience factors are: (1) the location where the
26 relevant agreements were negotiated and executed, (2) the state that is most familiar with the
27 governing law, (3) the plaintiff’s choice of forum, (4) the respective parties’ contacts with the
28 forum, (5) the contacts relating to the plaintiff’s cause of action in the chosen forum, (6) the

1 differences in the costs of litigation in the two forums, (7) the availability of compulsory process
 2 to compel attendance of unwilling non-party witnesses, and (8) the ease of access to sources of
 3 proof. *Jones v. GNC Franchising, Inc.*, 211 F.3d 495, 498-99 (9th Cir. 2000).⁶ An application of
 4 these factors, which weigh heavily in favor of keeping this case in this Court, reveals that this is a
 5 case in which declining to apply the first-to-file rule is justified, in order to reduce the incentives
 6 for a race to the courthouse. *E.g., Micron*, 518 F.3d at 905.

7 As is true in most patent infringement cases, the majority of the sources of proof in this
 8 case will come from the defendant, Google. *In re Genentech, Inc.*, 566 F.3d 1338, 1345 (Fed. Cir.
 9 2009). The fact that Google is headquartered in this district and conducts numerous activities
 10 relevant to this litigation out of its headquarters here shows the convenience of keeping this case in
 11 this Court at least under factors 4 (the parties' contacts with the forum), 5 (the contacts relating to
 12 Google's cause of action in this district), 6 (the differences in the costs of litigation in the two
 13 forums), and 8 (the ease of access to sources of proof). Google develops and maintains its accused
 14 search services in large part at its headquarters in the Northern District, and Google employee
 15 witnesses (including [REDACTED]) with knowledge of technical aspects of
 16 Google's search products predominantly work and reside in the Northern District. (Ex. 21 ¶¶ 11-
 17 12.) Similarly, Google employee witnesses with knowledge of marketing concerning these
 18 services (including [REDACTED]) are also primarily based in the Northern District. (*Id.* ¶ 13.) By
 19 contrast, Google is aware of no employee having potentially relevant knowledge in Texas. (*Id.*
 20 ¶ 15.) And Google has no facilities in the Eastern District. (*Id.* ¶ 16.) A trial in this district would
 21 be far more convenient for Google's witnesses, who would face a real and avoidable burden
 22 should they be required to travel away from this district for a trial in the Texas action.

23 Eolas may argue, as it did in opposing transfer in the Texas action (Ex. 20, 4-6, 8), that
 24 Google has left out information about where *all* potential witnesses and documents are located.
 25 However, binding Federal Circuit precedent holds that the presence of witnesses and evidence

26 ⁶ Google's motion to transfer the Texas action to this district, filed on February 9, 2016 in the
 27 Eastern District of Texas, provides a more detailed analysis of the § 1404(a) factors. (Ex. 39.)
 28 Google further contends that, under the proper interpretation of 28 U.S.C. § 1400 as outlined in
 the mandamus petition in *In re TC Heartland, LLC*, No. 16-105 (Fed. Cir.), scheduled for oral
 argument next week, venue in the Eastern District of Texas is improper.

1 outside the two competing forums does not factor into the analysis under § 1404(a). *In re Toyota*
2 *Motor Corp.*, 747 F.3d 1338, 1340 (Fed. Cir. 2014). Moreover, Google did establish that the
3 majority of potentially relevant employees are located in this district. (Ex. 39, 3.)

4 Further, the presence of numerous likely third-party witnesses in this district and none in
5 Texas results in at least factors 6 (the differences in the costs of litigation in the two forums), 7
6 (the availability of compulsory process to compel attendance of third-party witnesses), and 8 (the
7 ease of access to sources of proof) weighing heavily in favor of keeping this case here.
8 *Genentech*, 566 F.3d at 1343 (“The convenience of the witnesses is probably the single most
9 important factor in transfer analysis.”); *id.* at 1345 (“The fact that the transferee venue is a venue
10 with usable subpoena power . . . weighs in favor of transfer, and not only slightly.”). Numerous
11 witnesses reside in this district: two of three named inventors, the prosecuting attorney for the
12 ‘507 patent and the ‘443 patent family, and employees of the Regents with relevant knowledge of
13 the ‘507 patent, the ‘443 patent family, and the agreements related thereto. *Supra*, Summary of
14 Relevant Facts § I. Numerous prior artists such as Wei (whose knowledge was so important that
15 Eolas previously moved to compel him to respond to discovery requests (Ex. 11)), Dougherty,
16 Jacob, Kempf, and Andreessen also reside in the Northern District. *Id.* § III. By contrast, Google
17 is not aware of any non-party witness who resides or works in the Eastern District of Texas.
18 Whether third-party witnesses end up being willing or unwilling witnesses, it will be more
19 convenient and less costly for the witnesses and for the parties to litigate any alleged infringement
20 of the ‘507 patent in this Court: If the witnesses are willing, it is more convenient for them to
21 attend trial here, as there is no need for significant travel away from home. If the witnesses are
22 unwilling, only this Court may compel them to attend a trial. Fed. R. Civ. P. 45(c)(1).

23 As with Google’s witnesses, Eolas may point to prior artists outside both forums as it did
24 in its opposition to Google’s motion to transfer the Texas action. But that is an irrelevant fact as a
25 matter of law. *Toyota*, 747 F.3d at 1340. And notably, Eolas has not identified any prior art
26 witnesses in the Eastern District.

27 Additionally, because the invention was allegedly conceived here and Eolas’ allegations
28 call into question the work and reputation of engineers responsible for work related to these

products as well as Google’s own reputation, this district’s interest in this case (factor 4) is significant. *In re Hoffman-La Roche*, 587 F.3d 1333, 1336 (Fed. Cir. 2009) (holding that “local interest in this case remains strong because the cause of action calls into question the work and reputation of several individuals residing in or near th[e] district and who presumably conduct business in that community”). In light of Google’s significant connections to its home district, its choice of bringing this declaratory judgment action in this district—i.e., factor 3—should also weigh heavily in favor of keeping the case in this district. *E.g.*, *Center for Biological Diversity v. McCarthy*, No. 14-cv-5138, 2015 WL 1535594, at *3 (N.D. Cal. Apr. 6, 2015) (“Ordinarily, a plaintiff’s choice of forum receives substantial deference, especially when the forum is within the plaintiff’s home district or state.” (citing *Lou v. Belzberg*, 834 F.2d 730, 739 (9th Cir. 1987))).

Moreover, factors 1 (location of the relevant agreements) and 4 (the parties’ contacts with the forum) also favor this Court’s exercise of jurisdiction in light of Eolas’ extensive contacts with California as previously discussed, including: Eolas’ longstanding relationship with and significant obligations to the Regents (a California resident) pursuant to agreements executed by agents of the Regents in California; Eolas’ patent commercialization, licensing, and enforcement efforts purposefully directed at California and this forum; Eolas’ prosecution activities conducted from California; Eolas’ invention story centered in this district; and Eolas’ continuing relationship with two inventors who are still California residents. (*Supra*, Argument § I.B.)

By contrast, Eolas has few connections to Texas: its formal incorporation there began only in 2009, shortly prior to its bringing infringement claims against Google and other defendants in Texas; its only Texas-based officer’s purported residence in Texas began in December of last year, after Google filed this action and shortly before the only other Eolas employee in Texas moved away; and development activities allegedly taking place in Texas remain completely unspecified. (*See* Dkt. 37-1.) Indeed, judging from Eolas’ prior litigation against Google, at which Eolas’ only Texas-based employee (Mr. Swords), did not testify (Corredor Decl. ¶ 4), the only Eolas employee likely to testify in this case on behalf of Eolas is inventor Michael Doyle, who resides in the Chicago area. (Ex. 40.) Eolas may point to its office in Tyler, Texas, but that office was established in anticipation of *Eolas I*, and it therefore carries no weight in the analysis of the

1 convenience factors. *E.g.*, *In re Microsoft Corp.*, 630 F.3d 1361, 1364 (Fed. Cir. 2011)
2 (dismissing plaintiff’s “fallacious assumption[] that this court must honor connections to a
3 preferred forum made in anticipation of litigation and for the likely purpose of making that forum
4 appear convenient”); *In re Verizon Bus. Network Servs. Inc.*, 635 F.3d 559, 562 (Fed. Cir. 2011)
5 (declining to give weight to documents located in the Eastern District only as “artifacts of
6 [plaintiff’s] prior litigation” in the § 1404(a) analysis).

7 Coupled with the one-sided balance of witnesses, documentary sources of proof related to
8 the conception and reduction to practice of the invention claimed by the ‘507 patent and to the
9 transfer of that patent to Eolas are likely to be found in the records of the Regents in this district.
10 Similarly, prosecution history–related files held by patent prosecutor Krueger are also likely
11 located in this district. Key documentary evidence regarding prior art, including evidence relating
12 to early web browsers central to Eolas’ prior litigations, including ViolaWWW and NCSA
13 Mosaic, is also likely located in the Northern District of California given the connection of these
14 systems to this district discussed above.

15 Courts may exercise their discretion to stay the case pending the competing forum’s
16 determination of the § 1404(a) factors in the context of a motion to transfer. *E.g.*, *EMC*, 2012 WL
17 4097707, at *5. Generally, however, the Eastern District of Texas has not granted stays pending
18 resolution of transfer, allowing cases to proceed through discovery and to the merits with a
19 transfer motion pending. Indeed, the Eastern District has already set a schedule through trial in the
20 Texas action. (Ex. 41.) Thus, if this Court is inclined to grant a stay to permit that court to rule on
21 transfer, Google respectfully requests that the stay should be for a reasonable period of time (for
22 example, for 45 days) so that the Texas case does not proceed to an advanced stage before the
23 determination of the § 1404(a) factors is made. Under *Micron*, and as discussed above, the
24 Federal Circuit requires a judicial analysis of the convenience factors and a determination of
25 which one of the two competing forums is the proper one under § 1404(a).

26 **CONCLUSION**

27 For the foregoing reasons, Google respectfully requests that this Court deny Eolas’ motion
28 to dismiss Google’s complaint.

DATED: March 4, 2016

Respectfully submitted,

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Exhibit H

**IN THE UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF TEXAS
WACO DIVISION**

GABRIEL DE LA VEGA,

Plaintiff,

v.

GOOGLE LLC,

Defendant.

Case No. 6:19-cv-00617-ADA

**GOOGLE’S MOTION TO DISMISS UNDER FEDERAL RULE 12(B)(6)
FOR FAILURE TO STATE A CLAIM FOR RELIEF**

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I. INTRODUCTION

Plaintiff brings the present case after abandoning his patent application for more than eight years (from 2008-2017), and petitioning to revive it a year and a half after the Complaint admits the accused instrumentality, YouTube Live, was launched, claiming the delay that led to the abandonment was unintentional. The undisputed administrative record, which is properly considered on a motion to dismiss, shows that the Patent Office's decision to revive the application violated the Patent Office's own rules regarding unintentional delay. The Patent Office's grant of the petition to revive was therefore arbitrary, capricious, and an abuse of discretion that must be set aside under the Administrative Procedure Act ("APA"). When that improper agency action is set aside under the APA, the asserted patent is invalid because any alleged invention was abandoned.

Further, the Complaint fails to adequately plead a claim under *Iqbal/Twombly* because it merely recites or rephrases the asserted claims while alleging legal conclusions of infringement. The sparse facts alleged fail to state a claim for direct infringement because: (a) they ignore claim limitations altogether; or (b) at best, they suggest the acts of multiple parties are involved, but lack any allegations to support a viable claim of joint infringement.

The Complaint also fails to state a claim for indirect infringement. There are no allegations that would support a plausible claim for direct infringement, which is a prerequisite to an indirect infringement claim. Further, the Complaint (a) fails to provide any factual allegations to support the specific intent required for inducement; (b) fails to identify any basis for pre-suit indirect infringement; and (c) identifies substantial noninfringing uses of the accused functionality, which foreclose a claim for contributory infringement.

Google hereby moves to dismiss the complaint under Federal Rule of Civil Procedure 12(b)(6).

II. BACKGROUND

A. Nature and Stage of the Proceedings

Plaintiff filed its Complaint (Dkt. 1) against Google LLC on October 16, 2019, alleging infringement of U.S. Patent No. 10,205,986 (the “’986 patent”) (Dkt. 1-1) by YouTube Live. The Complaint asserts direct infringement (¶¶ 21, 25) and indirect infringement (¶ 21), including both induced infringement (¶¶ 24, 26-30) and contributory infringement (¶¶ 31-35).

B. The ’986 Patent and Asserted Claims

U.S. Patent Application No. 10/911,144, which issued as the ’986 patent, was filed August 4, 2004. ’986 patent at Cover. The Patent Office issued a final rejection on December 11, 2008. Ex. A (Prosecution History Excerpts) at 2008-12-11 Final Rejection. Applicant did not respond to the Patent Office’s final rejection. After confirming with the Applicant’s attorney — “Mr. Lubecki confirmed that no response to the Office Action mailed on 12/11/2008 has been filed” — the Examiner issued a Notice of Abandonment no later than June 15, 2009. Ex. A, 2009-06-15 Abandonment at 2.¹ Although the application had been abandoned for more than eight years, in December 2017 Plaintiff sought revival, a year and a half *after* the Complaint alleges the accused YouTube Live was launched. *See* Ex. A, 2017-12-19 Petition; Complaint ¶ 25 (citing June 2016 alleged launch of YouTube Live app). The Applicant’s statement of alleged unintentional delay admitted that the delay was caused by an “inability to provide payment to Applicant’s attorney for legal fees” and “lack of funds.” Ex. A, 2017-12-19 Statement of Unintentional Delay at 2. There is no indication that the Applicant or his attorney

¹ The patent and its prosecution are properly considered by a court in ruling on a 12(b)(6) motion. *See e.g., Tellabs, Inc. v. Makor Issues & Rights, Ltd.*, 551 U.S. 308, 322 (2007) (must consider entire complaint including documents incorporated into it and may take judicial notice of other matters); *OIP Techs., Inc. v. Amazon.com, Inc.*, 788 F.3d 1359, 1363 (Fed. Cir. 2015) (considering prosecution in affirming § 101 judgment on pleadings).

were unaware that the failure to respond in 2008 would abandon the application.

During the extensive prosecution of its claims, Applicant was required to substantially amend its claims to introduce several limitations that he does not and cannot show are performed by or at the direction of Google. Claim 1, with the language that the applicant added to gain allowance underlined, recites:

A method for selecting streaming image content from a network comprising:

providing real-time streaming image content output by a camera from at least one mobile content provider;

coupling said real-time streaming image content from said mobile content provider camera to the network using a networked computer in conjunction with cellular telephony, wherein said real-time streaming image content provided by said mobile content provider is acquired while in motion within the cellular telephony coverage area;

presenting said real-time streaming image content from said mobile content provider on a server homepage for selection; and

selecting said real-time streaming image content from said at least one mobile content provider presented on said homepage for viewing in real-time over the Internet, wherein a viewer filters the real-time streaming image content by selection criteria comprising at least one of a location, a name, a type, and an audio commentary.

See '986 patent at 9:20-41 (emphasis added); Ex. A, 2007-02-06 Amend. to the Claims at 3, 2007-08-08 Amend. to the Claims at 2, 2007-12-14 Amend. to the Claims at 2, 2008-07-23 Amend. to the Claims at 2, 2017-12-19 Amend. to the Claims at 2. System claim 9, the only other claim mentioned in the Complaint recites similar elements as “means for” performing the steps of claim 1 and was similarly heavily amended. '986 patent at 10:0-32; Ex. A at 2007-02-06 Amend. to the Claims at 4, 2007-08-08 Amend. to the Claims at 3, 2007-12-14 Amend. to the Claims at 3, 2008-07-23 Amend. to the Claims at 3, 2017-12-19 Amend. to the Claims at 3-4. As further discussed herein, Google refers to these limitations by the recited step (e.g., the “providing step,” the “coupling step,” the “presenting step,” and the “selecting step”).

III. LEGAL STANDARDS FOR MOTIONS TO DISMISS

“To survive a motion to dismiss, a complaint must contain sufficient *factual* matter, accepted as true, to ‘state a claim to relief that is plausible on its face.’” *Ashcroft v. Iqbal*, 556 U.S. 662, 678 (2009) (emphasis added) (citing *Bell Atl. Corp. v. Twombly*, 550 U.S. 544, 570 (2007)). Federal Rule of Civil Procedure 8(a)(2) requires that a complaint provide a defendant fair notice of the plaintiff’s claim and the grounds relied upon. This obligation “requires more than labels and conclusions, and a formulaic recitation of the elements of a cause of action will not do....” *Id.* at 555 (citations omitted). “On a motion to dismiss, courts are not bound to accept as true a legal conclusion couched as a factual allegation.” *Id.* (citation omitted); *see also Iqbal*, 556 U.S. at 678-79. Regional circuit law applies when reviewing a Rule 12 motion to dismiss. *OIP Techs., Inc. v. Amazon.com, Inc.*, 788 F.3d 1359, 1362 (Fed. Cir. 2015). In the Fifth Circuit, “the court applies the *Twombly*-plausibility standard.” *Lee v. Verizon Communs., Inc.*, 837 F.3d 523, 533 (5th Cir. 2016).

IV. ARGUMENT

A. The Patent Office Decision to Revive the Application Issuing as the ’986 Patent Was Arbitrary and Capricious, and Should be Overturned

The Patent Office’s decision to allow revival of the application leading to the ’986 patent should be set aside as unlawful under the Administrative Procedure Act (“APA”).

The Patent Office’s revival of the application under 37 C.F.R. § 1.137(b)(4), which only allows for revival if the “entire delay” was unintentional, was arbitrary and capricious, as well as an abuse of discretion, subject to this Court’s review under the APA, 5 U.S.C.

§ 706(2)(A).² Under the APA, a court “must ‘hold unlawful and set aside’ PTO actions found to

² The APA applies to decisions of the Patent Office. *See Dickinson v. Zurko*, 527 U.S. 150, 164 (1999).

be ‘arbitrary, capricious, an abuse of discretion, or others not in accordance with the law.’ *New York University v. Autodesk, Inc.*, 495 F. Supp.2d 369, 373 (S.D.N.Y. 2007) (“NYU”); *see also Lawman Armor Corp. v. Simon*, 74 U.S.P.Q.2d 1633, 2005 WL 1176973, at *5 (E.D. Mich. Mar. 29, 2005). “In applying that standard, the focal point for judicial review should be the administrative record already in existence, not some new record made initially in the reviewing court.” *Camp v. Pitts*, 411 U.S. 138 (1973). Here, that record is clear from the prosecution history itself, which is properly considered by the Court in ruling on a motion to dismiss. *See e.g., Tellabs*, 551 U.S. at 308; *OIP Techs.*, 788 F.3d at 1363. There are no disputed facts and dismissal is warranted under Rule 12(b)(6).

The Examiner sent a Notice of Abandonment in 2009, but only after confirming with the prosecuting attorney (Mr. Lubecki) that the Applicant had not sent a response. Ex. A, 2009-06-15 Abandonment at 2. The record thus reflects that Applicant’s attorney was aware of the need to respond and this knowledge is properly imputed to the Applicant. *See e.g., Fields Hybrids, LLC v. Toyota Motor Corp.*, No. Civ. 03-4121, 2005 WL 189710, *7 (D. Minn. Jan. 27, 2005). Under quite similar facts, where an Examiner confirmed with the Applicant’s representative that no action had been taken to respond, several courts have found that the delay could not be considered unintentional. *See e.g., Lawman*, 2005 WL 1176973, at *5; *NYU*, 495 F. Supp. 2d at 374.

Moreover, in the petition to revive the abandoned application, the Applicant asserted that the basis for contending that the delay was unintentional was that “Applicant was unable to provide a response due to inability to provide payment to Applicant’s attorney for legal fees.” Ex. A, 2017-12-19 Statement of Unintentional Delay at 2. Under the Patent Office’s own rules, however, the very reason the Applicant offered as the basis for unintentional delay is expressly

called out as showing the delay was deliberate and **not** unintentional. “A delay resulting from a deliberately chosen course of action on the part of the applicant does not become an ‘unintentional’ delay within the meaning of 37 CFR 1.137(b) because: . . . (E) the applicant remains interested in eventually obtaining a patent, **but simply seeks to defer patent fees and patent prosecution expenses.**” Ex. B – Manual of Patent Examining Procedure (“MPEP”) § 711.03(c) (9th Ed. Rev. 7) at II.C. (II. Petitions to Revive an Abandoned Application or Accept Late Payment of Issue Fee, subsection C. Unintentional Delay) (available at <http://mpep.uspto.gov/RDMS/MPEP/current#/current/d0e81012.html>) (emphasis added).³

Under the Patent Office’s own interpretation of its regulations, the inquiry is whether the course of action that resulted in the delay was unintentional, not whether the abandonment was unintentional. *Fields Hybrids*, 2005 WL 189710, *7; *Lawman*, 2005 WL 1176973, at *6-7. Based on the undisputed administrative record, the delay was not unintentional and the Patent Office acted in disregard of its own rules in reviving the abandoned application. Such failure to follow its own rules and disregard of the Examiner’s confirmation with Applicant’s attorney, who knew of the deadline and affirmed that no action had been taken, is clearly arbitrary and capricious, as well as an abuse of discretion, renders the Patent Office’s actions in reviving the application illegal and it must be set aside. *See e.g., NYU*, 495F. Supp. 2d at 374-75.⁴

³ This same text appeared in the MPEP in 2008 when the application was abandoned. Ex. C – MPEP (8th Ed. Rev. 6) § 711.03(c) at 700-192.

⁴ Google is mindful of the decision in *Aristocrat Techs. Australia PTY Ltd. v. International Game-Technology*, 543 F.3d 657 (Fed. Cir. 2008), but that case is inapplicable here as Google is not asserting improper revival as a defense under 35 U.S.C. § 282 in the present motion. In addition, the present case with an eight-year delay is not an instance of mere procedural irregularities where a deadline may have been missed by as little as one day. *Id.* at 658 (noting filing fee was received January 11, 2000 when it was due January 10, 2000) & 663 (referring to procedural irregularities and minor transgressions). Moreover, *Aristocrat* only mentions the APA in passing and limits its inapplicability to the facts of the case (including the very short and

Accordingly, Google respectfully requests that the Court dismiss Plaintiff's Complaint for failure to state a claim for relief.

B. The Complaint Fails to Set Forth a Plausible Claim for Direct Infringement

Plaintiff's Complaint should also be dismissed because it fails to plead factual allegations that are sufficient to support a plausible claim for direct infringement. The *Iqbal/Twombly* plausibility standard applies to claims of direct infringement of a patent. *See Artrip v. Ball Corp.*, 735 Fed. Appx. 708, 714 n.4 (Fed. Cir. 2018). Moreover, direct infringement only "occurs where all steps of a claimed method are performed by or attributable to a single entity." *Akamai Techs., Inc. v. Limelight Networks, Inc.*, 797 F.3d 1020, 1022 (Fed. Cir. 2015) (en banc).

Apart from reciting the claim language and pure legal conclusions (Complaint ¶¶ 20-21), Plaintiff's conclusory allegations regarding direct infringement are set forth in the Complaint at paragraphs 23 and 25. Even when read in the light most favorable to Plaintiff, these allegations fail to state a plausible claim for direct infringement for several reasons.

1. The Complaint Fails to Allege How the Coupling Step or Means Is Met

Plaintiff's Complaint should be dismissed because it fails to include any allegations that would support a plausible claim that anyone meets the "coupling step" of claim 1 (or the "means for coupling" in claim 9),⁵ which are the only claims identified in the Complaint.

The "coupling step" of claim 1 requires that a "mobile content provider" (content providing user) couple "real-time streaming image content" and that:

unintentional delay). *Id.* at 664. Nothing in *Aristocrat* resembles the lengthy delay here and the Patent Office's disregard of its own rules.

⁵ Claim 9 recites a "means for coupling" that includes these same functions that are recited in the "coupling step" of claim 1 ('986 patent at 10:14-20), yet the Complaint makes no allegations regarding how those functions are met or how any of the other means recited in claim 9 are met. As the Complaint fails to identify who or what is performing the steps in claim 1, it likewise fails to address the functions of claim 9, much less the corresponding structure.

- the coupling is done “*using a networked computer in conjunction with cellular telephony*” and
- the content that is coupled “*is acquired while said mobile content provider is in motion within the cellular telephony coverage area.*”

See Complaint ¶ 11; ’986 patent at 9:25-31 (emphasis added). As noted above, these additional limitations were added to overcome rejections based on the prior art. See Section II.B. The Complaint fails to allege that the coupling limitation is ever met, simply asserting that Google provides a YouTube application “to allow users to take live streaming video and upload them....” See *id.* ¶¶ 23, 25 (at p. 10-13). None of the web page excerpts included in the Complaint indicate how coupling is done “in conjunction with cellular telephony” or that the content is “acquired while in motion within the cellular telephony coverage area.” See, e.g., Complaint ¶ 25 (at p. 8-9) (failing to identify any content provided via the YouTube app, much less using cellular telephony, and showing no live streams provided while in motion within cell areas). The Complaint also fails to make any mention of who or what is performing the coupling step. Without any identification of the required “cellular telephony,” “cellular telephony coverage area,” “acquisition while in motion,” or who allegedly performs the multi-part coupling step, Google is not “on notice as to what [it] must defend.” *Artrip*, 735 Fed. Appx. at 714. Thus, dismissal for failure to state a claim of direct infringement is proper for this reason alone.

The complaint vaguely asserts that Google “owns, uses, operates, advertises, controls, sells, tests, and/or otherwise provides” infringing systems and methods, but as explained below fails to provide any evidence or assertion that Google practices each limitation of claims 1 or 9. Such “[t]hreadbare recitals of the elements of a cause of action, supported by mere conclusory statements, do not suffice.” *Lyda v. CBS Corp.*, 838 F.3d 1331, 1337 (Fed. Cir. 2017) (citing

Iqbal, 556 U.S. at 678 and *Twombly*, 550 U.S. at 555). Even if Google were to use or test portions of functionality that allegedly met these limitations, which the Complaint fails to allege, the Complaint fails to provide any factual allegation that Google or any other single actor uses or tests such claim features in concert with the other claim limitations such that the entire claim is practiced by a single actor. As explained above, there is no allegation that Google performs the “coupling step” at all, much less that it does so along with performing the other claim steps. For example, the Complaint fails to allege that Google or any other single actor performs the selecting step, which would require, at a minimum, that the actor carrying out the coupling step also acts as a viewer to filter content to select the same real-time streaming content acquired in the coupling step (both limitations require the “said real-time streaming image content”).

Because the Complaint fails to include any factual allegations to support that the coupling step or coupling means are met, Google respectfully requests that Plaintiff’s Complaint be dismissed for failure to state a claim for direct infringement of any claim of the ’986 patent.

2. The Complaint Relies Upon Activities of Multiple Actors Without Allegations that Support Joint Infringement

Plaintiff’s Complaint should also be dismissed because it fails to include any allegations that would support a plausible claim that any single actor performs the steps of claim 1 or provides the means for performing the same recited functions in claim 9, or any basis for a finding of joint infringement.

To meet the *Twombly/Iqbal* pleading standard for joint infringement by the combined acts of multiple parties, the Complaint must plead “facts sufficient to allow a reasonable inference that all steps of the claimed method are performed and either (1) one party exercises the requisite ‘direction and control’ over the other’s performance or (2) the actors form a joint enterprise such that performance of every step is attributable to the controlling party.” *Lyda*, 838

F.3d at 1339 (applying *Akamai* to affirm 12(b)(6) dismissal). In *Lyda*, the Federal Circuit dismissed a complaint that failed to set forth *factual allegations* to support assertions in the complaint that one entity directed or controlled others. *Id.* Dismissal was proper because there were no allegations that could “form the basis of a reasonable inference that each claim step was performed by or attributable to Defendants.” *Id.*

a. The Allegations of the Complaint Show That No Single Actor Performs the Steps of Claim 1 and There Are No Allegations to Support Joint Infringement

For those limitations of claim 1 that the Complaint even purports to address, the only allegedly infringing activity identified for most of them refers to actions by two distinct groups of YouTube users. For example, the Complaint makes the broad conclusory allegation that the YouTube application that it alleges is provided by Google allows “[*content provider*] users to take live streaming video and upload” it. Complaint ¶ 23 (emphasis added). Then it relies on other “users” to “*view and filter*” the content uploaded by the content provider users. Complaint ¶ 25 at p. 15 (emphasis added).

On its face, therefore, the Complaint relies upon the acts of multiple users (as shown in the table below that includes the purported explanation in the Complaint that follows each claim element).

Claim Element	Allegation in Complaint	Actors Identified
A method for selecting streaming image content from a network comprising:	Not addressed in Complaint	None
providing real-time streaming image content output by a camera from at least one mobile content provider;	“Description: Google provides an application called YouTube App which users may download and stream live video from their mobile device using the camera native to their mobile device.” (¶ 25 at 11)	Google and content providing user

Claim Element	Allegation in Complaint	Actors Identified
	(emphasis added)	
coupling said real-time streaming image content from said mobile content provider camera to the network using a networked computer in conjunction with cellular telephony, wherein said real-time streaming image content provided by said mobile content provider is acquired while in motion within the cellular telephony coverage area;	Not addressed in Complaint	None
presenting said real-time streaming image content from said mobile content provider on a server homepage for selection; and	“Description: Google provides an application for users’ mobile devices to view and filter live streaming videos on the www.youtube.com/live homepage.” (¶ 25 at 15)	Google and viewing user
selecting said real-time streaming image content from said at least one mobile content provider presented on said homepage for viewing in real-time over the Internet, wherein a viewer filters the real-time streaming image content by selection criteria comprising at least one of a location, a name, a type, and an audio commentary.	Description: Users of YouTube can search live streaming videos on the www.youtube.com/live homepage by typing in the name, keyword or type of the video they want to watch. (¶ 25 at 17)	Viewing user

Therefore, as set forth in the Complaint (and plainly indicated by the claim language), multiple actors are required to meet the limitations of claim 1. For example, content provider users are required to couple their content to the network using cellular telephony and acquire video content while in motion within a cellular coverage area. Meanwhile, the viewing user must filter and select content from web pages. Given that the patent describes streaming “live” content, Plaintiff has failed to provide any reasonable allegation to support that the same user

would be viewing their own live content.

The allegations of the Complaint, even if accepted as true, do not come close to providing factual allegations to support an inference of joint infringement because they do not even suggest that one party exercises direction or control over another or that the actors formed a joint enterprise as required to properly plead joint infringement. *Lyda*, 838 F.3d at 1339 (joint infringement requires pleading “facts sufficient to allow a reasonable inference that all steps of the claimed method are performed and either (1) one party exercises the requisite ‘direction and control’ over the other’s performance or (2) the actors form a joint enterprise such that performance of every step is attributable to the controlling party.”). In fact, nothing in the Complaint would meet the *Iqbal/Twombly* standard as explained in *Lyda*.

For the “providing step,” the Complaint simply alleges that “Google provides an application called YouTube App which users may download and stream live video from their mobile device using the camera native to their mobile device.” *Id.* ¶ 25 (at pp. 10-11). The “providing step,” however, requires providing content output from a camera from at least one mobile content provider. Thus, the limitation plainly requires the activities of a third party – i.e., content providing user — and there are no allegations that come close to supporting the inferences *Lyda* explains are required to support joint infringement.

Moreover, the Complaint fails to make any factual allegations to support that anyone performs the requirements of the “coupling step” (*see* Section IV.B), much less that the requirements for joint infringement are met. The Complaint is silent on the acts or the actor involved. There is no allegation (or basis for alleging) that Google provides content using a camera and couples the content using a cellular network, particularly where the content must be acquired while in motion within a cellular coverage area. Once again there are no allegations

that would support a plausible inference of joint infringement as required by *Lyda*.

The selecting step requires “wherein a viewer filters the real-time streaming image content by selection criteria comprising at least one of a location, a name, a type, and an audio commentary.” Complaint ¶ 25 at pp. 15-17. For the “selecting step,” the Complaint only alleges that “[viewing] [u]sers of YouTube can search live streaming videos on the www.youtube.com/live homepage by typing in the name, keyword or type of the video they want to watch.” Complaint ¶ 25 (at p. 17) (emphasis added). Again, the allegedly infringing activity requires the acts of different third parties – this time a viewing user — and there are no allegations that come close to supporting the inferences required to support joint infringement.

Despite apparently relying on the acts of multiple entities as allegedly performing the steps of the claimed method (and for some no actor is identified), the Complaint alleges no facts to support a claim for joint infringement. The Complaint fails to make even conclusory allegations of such direction, control, or joint enterprise, much less allege any facts in support of the same. Thus, the present case is even more appropriate for dismissal than in *Lyda*, where the court held that dismissal was proper where the complaint “allege[d] conclusively and without factual support that [defendant] directed or controlled the independent contractors who then directed or controlled the unnamed third parties.” *See Lyda*, 838 F.3d at 1340.

**b. The Complaint Fails to Address Any Limitation of Claim 9,
And There Are No Allegations to Support Joint Infringement**

The Complaint fails to address if or how the limitations of system claim 9, which recites “means for” limitations analogous to the steps of claim 1, are met. In that respect, the Complaint’s flaws with respect to claim 9 are even more troubling because the Complaint never identifies who provides the means to perform any of the recited functions.

“In order to ‘make’ a system under § 271(a), [a party] would need to combine all of the

claim elements.” *Centillion Data Sys., LLC v. Qwest Communs. Int’l*, 631 F.3d 1279, 1288 (Fed. Cir. 2011). As indicated above, the Complaint does not allege the system is combined by a single party. At least the acts of YouTube content providing users and YouTube viewing users are required for, *inter alia*, the functions of the providing, coupling, and selecting steps. Thus, the Complaint does not plead facts sufficient to support an inference that anyone “makes” the accused system.

Nor does a single party use the alleged system. To “use” a system, like claim 9, a party must “put the claimed invention into service, i.e., control the system and obtain benefit from it.” *Id.* at 1286. Vicarious liability for use of a system requires that the party allegedly using the system be directed by or act as an agent of the other party. *See Centillion*, 631 F.3d at 1287. A Complaint must also plausibly allege facts that the accused infringer “benefits from each element of the claimed system necessary to allege ‘use’ under § 271,” not just some general benefit from the use as a whole. *Grecia v. McDonald’s Corp.*, 724 Fed. Appx. 942, 946 (Fed. Cir. 2018) (applying *Intellectual Ventures I LLC v. Motorola Mobility LLC*, 870 F.3d 1302, 1329 (Fed. Cir. 2017) to affirm 12(b)(6) dismissal)). The Complaint here meets neither of these requirements. It neither alleges who controls or puts the system into use nor who benefits from each element of the claimed system.

In the context of claim 9, even if Google supplies the YouTube app, the claimed system cannot be “put into use” until a content providing user couples the content using cellular telephony and acquires the content while in motion in the cellular coverage area, and another viewing user filters and selects that video. There is no allegation that Google directs or controls those users to perform such functions, nor are those users acting as agents on Google’s behalf. Therefore, Google does not “use” system claim 9. *See Centillion*, 641 F.3d at 1287.

3. The Complaint Fails to State a Plausible Claim for Direct Infringement

Since no single party meets or supplies all the limitations of claims 1 or 9, and the Complaint provides no basis to even infer that YouTube content providing users or YouTube viewing users are directed by, controlled by, in a joint enterprise with, or agents of Google, there is no direct infringement of claims 1 or 9.

C. The Complaint’s Allegations of Indirect Infringement Fail to Set Forth a Plausible Claim and Should Be Dismissed

The Complaint fails to set forth plausible claims of direct infringement and, in the absence of such claims, there can be no indirect infringement. Also, any claim of pre-suit indirect infringement should be dismissed because there is no allegation that Google had pre-suit knowledge of the ’986 patent. In addition, the Complaint vaguely asserts that Google induced users to infringe (¶¶ 24, 26-30), but provides no evidence that Google induces users to acquire video content while in motion through cellular coverage areas as required by the claims. Finally, the Complaint establishes substantial noninfringing uses that preclude the claims of contributory infringement (¶¶ 31-35).

1. Without Direct Infringement, There Can Be No Indirect Infringement

The Complaint cannot set forth a plausible claim for indirect infringement because it fails to set forth a plausible claim for direct infringement.

To support a claim for indirect infringement, a plaintiff needs to plead “facts sufficient to allow an inference that at least one direct infringer exists.” *In re Bill of Lading*, 681 F.3d 1323, 1336 (Fed. Cir. 2012); *see also Dynacore Holdings Corp. v. U.S. Philips Corp.*, 363 F.3d 1263, 1272 (Fed. Cir. 2004) (“Indirect infringement, whether inducement to infringe or contributory infringement, can only arise in the presence of direct infringement....”).

The Complaint’s unsupported claims that Google’s customers directly infringe are legal

conclusions that need not be accepted as true in the face of a motion to dismiss. *See Twombly*, 550 U.S. at 555 (citation omitted); *see also Iqbal*, 556 U.S. at 678-79. As shown above, the Complaint provides no basis to even infer that a single user directly infringes or that there is a basis for a claim for joint infringement. For that reason alone, Plaintiff cannot state a claim for indirect infringement.

2. Any Claim of Pre-Suit Indirect Infringement is Unsupported for Failure to Plead Pre-Suit Knowledge of the '986 Patent

Indirect infringement (whether contributory or induced), requires knowledge of the patent in suit. *Commil USA, LLC v. Cisco Sys., Inc.*, 135 S. Ct. 1920, 1926 (2015). Therefore, a claim of pre-suit indirect infringement requires pre-suit knowledge of the '986 patent. *See Meetrix IP, LLC v. Cisco Sys., Inc.*, No. 18-309-LY, 2018 WL 8261315, at *3 (W.D. Tex. Nov. 30, 2018) (“because the complaint fails to sufficiently allege pre-suit knowledge, the pre-suit portion of the indirect-infringement claims should be dismissed”). The Complaint fails to plead any facts that plausibly support any allegation that Google had knowledge of the '986 patent prior to the filing of the Complaint, and only asserts that Google had knowledge of the '986 patent “[s]ince at least the filing of the Original Complaint.” Complaint ¶¶ 26, 28, 35. Any claim of pre-suit indirect infringement should be dismissed. *See Affinity Labs of Tex., LLC v. Toyota Motor North America, Inc.*, No. 13-365-WSS, 2014 WL 2892285, at *4 (W.D. Tex. May 12, 2014) (allegations insufficient where the “complaint does not express whether the induced infringement claim is limited to patent violations that occurred after the lawsuit was filed, or if the induced infringement claim includes Toyota's conduct or knowledge pre-lawsuit. Here, Toyota and the Court must speculate as to the extent and scope of Plaintiff's induced infringement claim.”).

3. The Complaint Fails to Allege the Requisite Specific Intent and Action to Support a Plausible Claim for Induced Infringement

The Complaint fails to set forth a plausible claim for induced infringement because it

does not allege facts to support an inference of the intent required for induced infringement. For claims of induced infringement, the complaint must plead facts that plausibly show the defendant had specific intent to cause another to directly infringe and knew the other's act constituted infringement. *In re Bill of Lading*, 681 F.3d at 1339.

One example is sufficient to show that the Complaint fails to state a claim for induced infringement. For example, the coupling step/function requires a third party direct infringer of claim 1 or 9 to acquire video content “while in motion within the cellular telephony coverage area”; simply using the YouTube App or even streaming video live from the YouTube App does not infringe. “The mere knowledge of possible infringement by others does not amount to inducement; specific intent and action to induce infringement must be proven.” *Cleveland Clinic Found. v. True Health Diagnostics LLC*, 859 F.3d 1352, 1364 (Fed. Cir. 2017); *see also Affinity*, No. 13-365-WSS, 2014 WL 2892285, at *7 (dismissing induced infringement claims where “Plaintiff does not specify how the marketing and selling activities of Toyota actually induced third-parties to infringe the Asserted Patents. The complaint generally alleges that Toyota induced its customers to purchase its vehicles, but fails to allege how Toyota induced its customers to use the vehicles in a manner that would violate the Asserted Patents.”). The Complaint alleges no facts that suggest any connection between Google and content providing users to encourage them to acquire content while in motion within a cellular coverage area, much less an intent to have them do so. *See* Complaint ¶ 29 (citing a website that does not discuss motion or cellular coverage areas). In fact, as explained above, the Complaint fails to allege anyone is performing the coupling step or coupling means functions. In order to plausibly plead induced infringement, the law requires a showing that Google induced someone to perform all of the steps that constitute infringement. The Complaint fails to do so, and therefore “falls short of

showing ‘specific intent and action’ on behalf’ of Google to induce anonymous third-party infringement of the ’986 patent. *See Cleveland Clinic*, 859 F.3d at 1364.

4. The Complaint Alleges Facts Foreclosing a Plausible Claim for Contributory Infringement

Aside from failing to state a plausible claim for direct infringement, the Complaint alleges facts that preclude a plausible inference of contributory infringement.

Contributory infringement requires that a defendant sell, offer to sell or import “a component of a patented machine, manufacture, combination or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use.” 35 U.S.C. § 271(c). Thus, to properly plead a claim for contributory infringement, the Complaint must allege facts sufficient to infer that any “component” alleged to provide the basis for contributory infringement has no substantial noninfringing use. *In re Bill of Lading*, 681 F.3d at 1337; *see also Iron Oak Techs., LLC v. Dell, Inc.*, No. 17-999-RP, 2018 WL 1631396, at *2 (W.D. Tex. Apr. 4, 2018) (dismissing contributory infringement claim because “conclusory allegation that ‘[t]he components provided by [Dell] are not staple articles of commerce suitable for substantial non-fringing use,’ (id.), is no more than a ‘threadbare recital’ of one of the elements of a contributory infringement claim”).

The Complaint demonstrates that the accused service has substantial noninfringing uses. The YouTube Live service does not require a user to use a cellular connection or be in motion as required by the coupling step in claim 1 (and the coupling means in claim 9). *See e.g.*, Complaint ¶ 25 (p. 13) (screenshot showing that users can livestream in a variety of circumstances, like a classroom or while playing a videogame, that have no motion or cellular

connection requirement). Moreover, that same screenshot notes that to stream live on a mobile device a user must have 1,000 subscribers, which means many users of the YouTube App (with less than 1,000 subscribers) are using the App without live streaming, demonstrating substantial noninfringing use. *Id.*

V. CONCLUSION

Google respectfully requests that Plaintiff's Complaint be dismissed with prejudice for the foregoing reasons.

Dated: December 12, 2019

Respectfully submitted,

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CERTIFICATE OF SERVICE

Pursuant to the Federal Rules of Civil Procedure and Local Rule CV-5, I hereby certify that, on December 12, 2019, all counsel of record who have appeared in this case are being served with a copy of the foregoing via the Court's CM/ECF system.

/s/ Michael E. Jones
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Exhibit I

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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
OAKLAND DIVISION

HYPERMEDIA NAVIGATION LLC,

Plaintiff,

v.

GOOGLE LLC,

Defendant.

Case No. 4:18-cv-06137-HSG

**GOOGLE LLC'S NOTICE OF
MOTION AND MOTION TO DISMISS
PLAINTIFF'S AMENDED
COMPLAINT FOR FAILURE TO
STATE A CLAIM PURSUANT TO
FED. R. CIV. P. 12(b)(6)**

Date: April 11, 2019
Time: 2:00 p.m.
Judge: Honorable Haywood S.
Gilliam, Jr.
Courtroom: 2, 4th Floor

NOTICE OF MOTION AND MOTION

Defendant Google LLC (“Google”) gives notice that on April 11, 2019, at 2:00 p.m., in Courtroom 2, 4th Floor, 1301 Clay Street, Oakland, CA 94612, before the Honorable Haywood S. Gilliam, Jr., Google will and hereby does move under Rule 12(b)(6) of the Federal Rules of Civil Procedure for an order dismissing with prejudice the claims of induced and willful infringement in the December 9, 2018 Amended Complaint filed by Hypermedia Navigation LLC (“Plaintiff” or “Hypermedia”) (ECF 16). This motion is based on this Notice of Motion, the Memorandum of Points and Authorities, all documents in the Court’s file, and such other written or oral argument as may be presented at or before the time this motion is heard by the Court.

RELIEF SOUGHT

Pursuant to Rule 12(b)(6) of the Federal Rules of Civil Procedure, Google moves to dismiss with prejudice Hypermedia's induced and willful infringement claims for failure to state a claim upon which relief can be granted.

Dated: January 4, 2019

Respectfully submitted,

By: /s/ *Melody Drummond Hansen*

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MEMORANDUM OF POINTS AND AUTHORITIES

I. INTRODUCTION

Plaintiff Hypermedia Navigation LLC's ("Hypermedia") claims of willful and induced infringement should be dismissed because they fail to plead facts to plausibly support that Defendant Google LLC ("Google") had pre-suit knowledge of its alleged infringement or to show the requisite "egregious" behavior or "specific intent" (respectively) to support such claims. Instead, Hypermedia relies only on a vague, insufficient pre-suit letter and conclusory assertions that parrot legal elements without alleging specific facts that might plausibly support willful or induced infringement.

Hypermedia alleges that Google willfully infringes seven of the eleven asserted patents, relying on a pre-suit letter that it claims to have sent to Google on August 18, 2017. Hypermedia does not describe or attach the letter to its Amended Complaint, alleging only that it made Google aware that "Plaintiff alleged" that various products "infringed one or more of" these seven patents. This is unsurprising because the contents of the letter reveal that it did not make Google aware of any alleged infringement. To the contrary, the letter merely lists Hypermedia's entire patent portfolio; points to three figures from one patent as showing what Hypermedia's technology allegedly "covers;" then includes a chart listing seven patents and five products with various boxes marked, without explaining how Google allegedly infringes any of Hypermedia's patent claims. Pointing to three patent figures from one patent cannot put Google on notice of why Google's products allegedly infringe any claim of any patent. Hypermedia also fails to plead facts plausibly supporting that Google's conduct was "egregious," as required to establish willfulness under *Halo Elecs., Inc. v. Pulse Elecs., Inc.*, 136 S. Ct. 1923 (2016). Hypermedia alleges only that Google's failure to respond to Hypermedia's letter with evidence of non-infringement or invalidity was egregious. But the law is clear that plausibly alleging "egregious" conduct requires more than making conclusory allegations of knowledge and infringement.

Hypermedia's inducement claims likewise fail. Hypermedia again relies on its August 2017 letter to support Google's alleged pre-suit knowledge that its actions would induce infringement of the same seven patents—but, for the same reasons, the contents of the letter belie

1 that assertion. And for the one additional patent that Hypermedia adds to the inducement claim,
2 the letter did not even identify the patent because it had not yet issued when the letter was sent;
3 the letter instead only included the pending application number in its listing of Hypermedia's
4 entire portfolio. In addition, Hypermedia fails to plead facts plausibly supporting that Google had
5 "specific intent" to induce infringement—either pre-suit or post-suit. Hypermedia alleges
6 induced infringement for five of the accused products, based on two paragraphs that string-cite
7 Google's user support webpages for only one of those accused products (YouTube). And, with
8 respect to YouTube, the string citations do not show or explain how those webpages could cause
9 or encourage users to infringe any of the 117 asserted claims of eight patents, much less how
10 Google specifically intended to induce such infringement.

11 Granting leave to amend, moreover, would be futile because (1) Hypermedia was on
12 notice of the deficiencies in its claims before filing its First Amended Complaint and was unable
13 to revise them to sufficiently plead the claims and (2) the patents for which Hypermedia asserts
14 willful and induced infringement expired the day after its original complaint was filed, so
15 Hypermedia cannot cure its post-suit claims for willful or induced infringement.

16 Hypermedia's willful and induced infringement claims should therefore be dismissed with
17 prejudice.

18 **II. ISSUES TO BE DECIDED**

19 Whether the Amended Complaint fails to state claims for willful infringement because
20 Hypermedia does not plead facts sufficient to plausibly support allegations that Google (1) had
21 pre-suit knowledge of alleged infringement of the relevant patents, or (2) has engaged in
22 "egregious" conduct that would warrant enhanced damages.

23 Whether the Amended Complaint fails to state claims for induced infringement because
24 Hypermedia does not plead facts sufficient to plausibly support allegations that Google (1) had
25 pre-suit knowledge of the existence of the relevant patents, (2) had pre-suit knowledge that its
26 actions would induce infringement of any of the relevant patents, or (3) has the "specific intent"
27 to induce its customers to infringe.

III. FACTUAL BACKGROUND

On October 5, 2018, Hypermedia filed a complaint alleging that Google infringes 158 claims of eleven patents related to “linear” navigation of different “elements,” such as webpages, video, or audio on the Internet: U.S. Patent Nos. 7,383,323 (“’323 Patent”), 7,383,324 (“’324 Patent”), 7,424,523 (“’523 Patent”), 7,478,144 (“’144 Patent”), 7,769,830 (“’830 Patent”), 8,250,173 (“’173 Patent”), 9,083,672 (“’672 Patent”), 9,772,814 (“’814 Patent”), 9,864,575 (“’575 Patent”), 6,779,026 (“’026 Patent”), and 9,990,174 (“’174 Patent”) (collectively, the “Asserted Patents”). ECF 1. That Complaint alleged willful infringement of seven patents and induced infringement of all eleven patents. *Id.* ¶¶ 24, 227, 219. After Google identified deficiencies in the Complaint, Hypermedia filed an Amended Complaint alleging infringement of the same eleven patents, willful infringement of seven patents, and induced infringement of eight patents. *See* ECF 16 ¶¶ 229, 219; Declaration of Melody Drummond Hansen (“Drummond Hansen Decl.”) ¶ 2. Hypermedia accuses Google of infringement based on its YouTube, Google Play Music, Google Video, Google Play Movies, Android TV, Google Images, and Google App products. *See, e.g., id.* ¶¶ 24, 169, 191, 221, 229.

Hypermedia alleges willful and induced infringement beginning in August 21, 2017, over a year before Hypermedia filed suit. *Id.* ¶ 25. Hypermedia relies on a letter that it alleges was sent to Google on August 18, 2017, and received at Google on August 21, 2017, (“the Letter”). *Id.* ¶ 25. While Hypermedia did not attach the Letter to its Complaint or Amended Complaint, it provided an unsigned copy to Google’s counsel after the Complaint was filed. *See* Drummond Hansen Decl. Ex. A. The Letter does not describe the patented technology, excerpt any claim language, or even identify any claims allegedly infringed by any Google product. *Id.* Instead, the Letter (1) lists Hypermedia’s entire patent and application portfolio without providing any description of what Hypermedia’s patents claim (*id.* at 1); (2) asserts that Hypermedia’s “technology covers” three figures from the ’672 Patent, again without any explanation (*id.* at 2.); and (3) includes a table listing seven patents — the ’323, ’324, ’523, ’672, ’830, ’173, and ’144 Patents—and five Google products (YouTube, Google Play Music, Google Video, Google Play Movies, and Android TV), with various boxes marked to allegedly indicate which of Google’s

offerings “provides this technology” (*id.*). The Letter closes with an invitation to have a “non-litigation business discussion.” *Id.*

Relying solely on this Letter, Hypermedia alleges that Google willfully infringes the ’323, ’324, ’523, ’672, ’830, ’173, and ’144 Patents (the “Willfulness Patents”) based on the five products identified in the Letter. *See* ECF 16 ¶¶ 229-231. Hypermedia, however, pleads no facts to plausibly support that Google knew that its products infringed any of these patents or acted in an “egregious” manner. Instead, Hypermedia asserts that Google “failed to provide any material, description, reasoning, or evidence of non-infringement or invalidity” of the seven patents. *Id.* ¶ 232. Hypermedia then parrots the legal elements of willfulness, alleging that “Defendant’s conduct is egregious as it continued offering, selling, making and using the Accused Instrumentalities despite knowledge of the infringement” and “Defendant’s infringement is and has been willful, wanton, malicious, bad-faith, deliberate, consciously wrongful, and fragrant [*sic*].” *Id.*

Hypermedia relies on the same August 2017 Letter for its induced infringement claims, alleging that Google induced users of the five accused products identified in its Letter to infringe the same seven Willfulness Patents, plus the ’814 Patent (collectively, the “Inducement Patents”). *Id.* ¶ 219. As with its willfulness claims, however, Hypermedia does not plead allegations to support Google’s knowledge of infringement for any of these eight patents. For the ’814 Patent, Hypermedia cannot even support knowledge of the patent, because its alleged notice was provided before the ’814 Patent issued. And Hypermedia fails to plead any facts to plausibly support that Google acted with “specific intent” for its users to infringe any of the Inducement Patents. *See id.* ¶¶ 219-220. Hypermedia instead vaguely refers to “instructions and support” and string-cites three webpages, alleging: “Defendant provides instructions on using YouTube which leads to infringement by end-users. *See e.g.,* https://support.google.com/youtube/answer/2398242?hl=en&ref_topic=4489102; <https://support.google.com/youtube/answer/92651?hl=en> (“Up Next” Videos); <https://support.google.com/youtube/answer/6327615?hl=en&co=GENIE.Platform=Desktop> (“Autoplay Videos”).” *Id.* ¶¶ 226-227. But the three cited webpages are support sites for just *one* accused product, YouTube, and Hypermedia cites no basis for its

1 induced infringement allegations for the other four products included in Hypermedia's
2 inducement allegations: Google Play Music, Google Video, Google Play Movies, and Android
3 TV. And with respect to YouTube, it is unclear how the cited websites relate to accused features
4 or could induce end users to infringe any Hypermedia patents. For example, the first website,
5 titled "Find your way around YouTube," provides introductory instructions for using YouTube,
6 such as its various menu options (*e.g.* Guide, Home, Subscriptions, etc.), none of which are
7 accused in this action. The second and third links are titled "'Up Next' videos" and "'Autoplay'
8 videos," respectively, and describe how YouTube automatically plays another video after the
9 current one ends. Hypermedia does not identify any statements from these websites that either
10 instruct users to infringe or advertise features accused of infringing.

11 The Willfulness Patents and the '814 Patent all expired on October 6, 2018—the day after
12 Hypermedia filed its lawsuit. *See, e.g.,* Drummond Hansen Decl. Ex. A.¹

13 **IV. LEGAL STANDARDS**

14 **A. Motion To Dismiss**

15 Under Federal Rule of Civil Procedure 12(b)(6), a district court must dismiss a complaint
16 if it fails to state a claim upon which relief can be granted. To survive a motion to dismiss, a
17 complaint must plead "enough facts to state a claim to relief that is plausible on its face." *Bell*
18 *Atl. Corp. v. Twombly*, 550 U.S. 544, 570 (2007). A claim has facial plausibility when the party
19 asserting it pleads factual content that allows the court to draw the reasonable inference that the
20 defendant is liable for the misconduct alleged. *Ashcroft v. Iqbal*, 556 U.S. 662, 678 (2009); *see*
21 *Twombly*, 550 U.S. at 555 ("factual allegations must be enough to raise a right to relief above the
22 speculative level."). Conclusory allegations or "formulaic recitation of the elements of a cause of
23 action will not do." *Iqbal*, 556 U.S. at 681.

24 **B. Willful Infringement**

25 Willful infringement is reserved for "egregious infringement behavior," which is typically
26 described as "willful, wanton, malicious, bad-faith, deliberate, consciously wrongful, flagrant, or

27 ¹ Although the Letter identifies a later expiration date for the '830 Patent, *i.e.*, November 15, 2018
28 (*see* Ex. A), it is unclear on what that assertion is based.

— indeed — characteristic of a pirate.” *Halo Elecs., Inc. v. Pulse Elecs., Inc.*, 136 S. Ct. 1923, 1932 (2016). To state a claim for willful infringement, a plaintiff must plead that (1) a defendant had knowledge of the asserted patents at the time of alleged wrongdoing, and (2) the defendant’s conduct rises to the level of egregiousness described in *Halo*. See, e.g., *Finjan, Inc. v. Juniper Networks, Inc.*, No. 17-05659-WHA, 2018 WL 905909, at *4-5 (N.D. Cal. Feb. 14, 2018) (dismissing complaint for failing to show pre-suit knowledge and egregious conduct). Willful infringement also requires showing that the defendant knew that it was allegedly infringing the asserted patents at the time the defendant’s conduct is alleged to have been willful. See, e.g., *NetFuel, Inc. v. Cisco Sys. Inc.*, No. 5:18-CV-02352-EJD, 2018 WL 4510737, at *3 (N.D. Cal. Sept. 18, 2018) (This district has recognized that “there can be no infringement of a patent, willful or otherwise, until the patent issues and the defendant learns of its existence *and alleged infringement*.”) (emphasis added); *Longitude Licensing v. Apple Inc.*, No. 14-CV-04275-EDL, 2015 WL 1143071, at *2 (N.D. Cal. Mar. 13, 2015).

C. Induced Infringement

To support a claim for induced infringement, a plaintiff must plead facts plausibly supporting that (1) a defendant knew its actions would induce actual infringement; and (2) the defendant had the specific intent to encourage another’s infringement. See *CAP Co. v. McAfee, Inc.*, No. 14-CV-05068-JD, 2015 WL 3945875, at *3 (N.D. Cal. June 26, 2015) (dismissing inducement claims, citing cases including *Commil USA, LLC v. Cisco Sys., Inc.*, 135 S. Ct. 1920, 1926–28 (2015) (quoting *Global-Tech Appliances, Inc. v. SEB S.A.*, 131 S. Ct. 2060, 2068 (2011)); see also *Grobler v. Sony Computer Entm’t Am. LLC*, No. 5:12-CV-01526-LHK, 2013 WL 308937, at *3 (N.D. Cal. Jan. 25, 2013) (quoting *In re Bill of Lading Transmission & Processing Sys. Patent Litig.*, 681 F.3d 1323, 1339 (Fed. Cir. 2012))).

V. ARGUMENT

A. Hypermedia Fails To Adequately Plead Willful Infringement

Hypermedia’s willful infringement claims should be dismissed for two independent reasons: (1) Hypermedia fails to plead facts plausibly supporting Google’s pre-suit knowledge of

1 alleged infringement; and (2) Hypermedia fails to plead facts plausibly supporting that Google's
2 conduct is "egregious," as required by *Halo*.

3 **1. Hypermedia Fails To Plead Facts That Could Plausibly Support Pre-**
4 **Suit Knowledge Of Infringement**

5 The Supreme Court explained in *Halo* that "culpability is generally measured against the
6 knowledge of the actor at the time of the challenged conduct." *Halo Elecs.*, 136 S. Ct. at 1933.
7 Courts in this District have held that claims of willful patent infringement require an allegation
8 not only that the defendant knew of the asserted patents, but also that the defendant knew of its
9 alleged infringement during the relevant time period. *See, e.g., NetFuel, Inc. v. Cisco Sys. Inc.*,
10 No. 5:18-CV-02352-EJD, 2018 WL 4510737, at *3 (N.D. Cal. Sept. 18, 2018) ("This district has
11 recognized that 'there can be no infringement of a patent, willful or otherwise, until the patent
12 issues *and the defendant learns of its existence and alleged infringement.*' (emphasis added));
13 *see also Longitude Licensing v. Apple Inc.*, No. 14-CV-04275-EDL, 2015 WL 1143071, at *2
14 (N.D. Cal. Mar. 13, 2015) (holding that pre-suit willful infringement allegations require
15 knowledge of *alleged infringement* before the lawsuit was filed). Hypermedia's Amended
16 Complaint, however, does not allege any facts that would support that Google had pre-suit
17 knowledge that it infringed any claim of the seven Willfulness Patents.

18 Here, Hypermedia relies solely on the August 2017 Letter to support Google's pre-suit
19 knowledge of alleged infringement. But the Letter does not actually allege that Google infringes
20 any claim of any Hypermedia patent, much less explain how Google allegedly infringes.
21 Drummond Hansen Decl. Ex. A. Instead, the Letter lists all patents and pending applications in
22 Hypermedia's portfolio; states "[t]he technology covers:" and copies three figures from one of the
23 patents; and then asserts that Google "provides this technology," followed by a table purporting to
24 illustrate that assertion. *See id.* Nowhere does the Letter attach any claim charts or even assert
25 that Google infringes any claim of any patent — to the contrary, the Letter ends by inviting
26 Google to engage in a "non-litigation business discussion." *Id.*

27 To the extent Hypermedia argues the Letter sufficiently alleges infringement because it
28 identifies three patent figures and then includes a table purporting to show that Google's products

1 provide technology related to certain Hypermedia patents, this argument fails. The letter's
2 excerpt of three figures and a table listing seven patents and five products cannot plausibly
3 support Google's pre-suit knowledge of infringement. First, infringement cannot be asserted by
4 comparing an accused product to a patent *figure*. See, e.g., *France Telecom S.A. v. Marvell*
5 *Semiconductor Inc.*, No. 12-CV-04967-WHO, 2014 WL 4272771, at *4 (N.D. Cal. Aug. 28,
6 2014); *Catalina Lighting, Inc. v. Lamps Plus, Inc.*, 295 F.3d 1277, 1286 (Fed. Cir. 2002)
7 ("infringement is to be determined by comparing the asserted claim to the accused device, not by
8 comparing the accused device to the figures of the asserted patent."). Here, Hypermedia's Letter
9 does even less—it does not even compare any product to any specific figure. Rather, it excerpts
10 three figures from one patent without any analysis or explanation, and generically refers to these
11 figures as "technology" that belongs to Hypermedia. Second, the table isn't sufficiently clear
12 about what it purports to illustrate to provide notice of anything. Specifically, the Letter asserts
13 that the table shows that Google provides "this technology," which refers to the three patent
14 figures copied from one patent, but the "Y" marks in the table appears to be asserting that each
15 Google product provides technology in some or all of seven patents, apparently suggesting that
16 certain products use technology from some patents but not others. Hypermedia provides no
17 explanation about what the "Y" marks actually mean or how they relate to the three figures
18 copied from one patent. Thus, the Letter cannot plausibly support that Google had pre-suit
19 knowledge that it infringed any claim of any Asserted Patent.²

20 Indeed, courts in this District have found more detailed assertions of infringement to be
21 insufficient to survive a Rule 12 motion to dismiss. For example, in *Finjan v. Juniper Networks*,
22 plaintiff Finjan provided pre-suit correspondence to defendant with a claim chart for a related
23 patent. 2018 WL 905909, at *1. The court held that the claim chart, which mapped the claims of
24 a related but un-asserted patent, was insufficient to demonstrate that the defendant had pre-suit
25 knowledge of infringement of an asserted patent. *Id.* at *3. By comparison, Hypermedia relies
26

27
28 ² The Letter's failure to identify any claims is especially relevant here because the seven
Willfulness Patents include a combined total of 220 claims.

1 on less: merely three figures of one asserted patent without any explanation of how Google's
2 products allegedly infringe any claim of any Hypermedia patent.

3 Because Hypermedia fails to plead sufficient facts to plausibly support that Google had
4 knowledge of its alleged infringement of any Hypermedia patent, the Court should dismiss
5 Hypermedia's claims for willful infringement.

6 **2. Hypermedia Fails To Plead Facts That Could Plausibly Support That**
7 **Google Engaged In "Egregious" Conduct**

8 Hypermedia's willful infringement claims fail for a separate, independent reason. After
9 the Supreme Court's *Halo* decision, courts in this District have required plaintiffs to plead facts
10 sufficient to demonstrate "egregious" conduct to sustain a willful infringement claim. *See, e.g.,*
11 *Finjan*, 2018 WL 905909, at *3; *Finjan, Inc. v. Cisco Sys. Inc.*, No. 17-CV-00072-BLF, 2017 WL
12 2462423, at *5 (N.D. Cal. June 7, 2017). In *Finjan v. Cisco*, for example, Finjan made
13 conclusory assertions that "[d]espite knowledge of Finjan's patent portfolio, Defendant has sold
14 and continues to sell the accused products and services." 2017 WL 2462423, at *5. The court
15 dismissed Finjan's willful infringement claims, explaining that "simply ma[king] conclusory
16 allegations of knowledge and infringement" is "not enough to plausibly allege egregiousness."
17 *Id.* (internal quotes and brackets omitted). Because the complaint included "no specific factual
18 allegations about Cisco's subjective intent, or any other aspects of Cisco's behavior that would
19 suggest its behavior was 'egregious,'" the court held that the willfulness claims failed. *Id.*

20 Hypermedia's allegations likewise fail to suggest any alleged "egregious" conduct.
21 Hypermedia's Letter at most mentions asserted patents and accused products but fails to give
22 notice of how the products allegedly infringed. Now, Hypermedia alleges that Google's conduct
23 was egregious because Google allegedly "failed to provide any material, description, reasoning,
24 or evidence of non-infringement or invalidity of the Presented Patents" in response to
25 Hypermedia's Letter and continued selling the named products. ECF 16 ¶ 232. Hypermedia also
26 includes a conclusory allegation that "Defendant's infringement is and has been willful, wanton,
27 malicious, bad-faith, deliberate, consciously wrongful, and fragrant [*sic*]." *Id.* But as *Finjan v.*
28

1 *Cisco* held, “conclusory allegations of knowledge and infringement” are “not enough to plausibly
2 allege egregiousness.” 2017 WL 2462423, at *5.

3 The Court should therefore dismiss Hypermedia’s claims of willful infringement for
4 failing to plead facts plausibly supporting Google’s pre-suit knowledge of alleged infringement
5 and failing to plead facts supporting that Google’s behavior was “egregious” pre-suit or post-suit.

6 **B. Hypermedia Fails To Adequately Plead Induced Infringement**

7 Hypermedia’s inducement claims fail for reasons similar to its willfulness allegations.
8 First, Hypermedia’s pre-suit Letter is insufficient to plausibly support that Google had pre-suit
9 knowledge of the existence of the ’814 Patent or of its alleged infringement of any of the eight
10 Inducement Patents. Second, Hypermedia fails to plead facts plausibly supporting that Google
11 had the required “specific intent” to induce infringement because: (a) for four of the products
12 accused for inducement, Hypermedia provides no supporting facts, and (b) for the fifth accused
13 product (YouTube), the cited web pages do not relate to the accused infringement.

14 **1. Hypermedia Fails To Plead Facts Plausibly Supporting Pre-Suit**
15 **Knowledge Of The ’814 Patent Or Of Infringement For Any Patent.**

16 For the reasons discussed above, Hypermedia’s Letter is insufficient to support Google’s
17 knowledge of alleged infringement. The Letter does not assert that any Google product infringes
18 any claim of any Hypermedia patent, instead generically referring to Hypermedia “technology”
19 and Google products that may use that “technology” and inviting a “non-litigation business
20 discussion.” *See supra* and Drummond Hansen Decl. Ex. A. Nor does Hypermedia plead any
21 facts supporting that Google knew any of its actions would allegedly induce actual infringement
22 by others. This flaw is fatal for all eight Inducement Patents.

23 Hypermedia’s inducement claims for the ’814 Patent fail for additional reasons.
24 Hypermedia fails to allege that Google even knew of the existence of the ’814 Patent. As
25 Hypermedia’s Amended Complaint acknowledges, its Letter did not identify the ’814 Patent;
26 rather, it identified a pending patent application that later issued as the ’814 Patent. ECF 16 ¶¶
27 25, 220. And Hypermedia does not allege that it provided any notice to Google of the ’814 Patent
28 after issuance. As courts in this District hold, knowledge of a patent application alone is

insufficient to meet the knowledge requirement of a patent for induced infringement. *See, e.g., VIA Techs., Inc. v. ASUS Computer Int'l*, No. 14-CV-03586-BLF, 2015 WL 3809382, at *3 (N.D. Cal. June 18, 2015) (“The general rule in this district is that knowledge of a patent *application* alone is insufficient to meet the knowledge requirement for either a willful or induced infringement claim.”) (collecting cases). Hypermedia’s Letter, moreover, did not even include the ’814 Patent application in its table listing patents and Google’s five products that purportedly provided Hypermedia’s “technology.” *See* Drummond Hansen Decl. Ex. A.

Because Hypermedia fails to adequately plead that Google had pre-suit knowledge of alleged infringement, its claims for pre-suit induced infringement should be dismissed.

2. Hypermedia Fails To Plead Facts Plausibly Supporting That Google Had Specific Intent To Encourage Others’ Infringement.

Hypermedia’s inducement claims also fail to plead any facts supporting that Google had specific intent to encourage its customers to infringe, providing an independent basis to dismiss these claims. *See, e.g., Grobler v. Sony Computer Entm’t Am. LLC*, No. 5:12-CV-01526-LHK, 2013 WL 308937, at *3 (N.D. Cal. Jan. 25, 2013) (*quoting In re Bill of Lading Transmission & Processing Sys. Patent Litig.*, 681 F.3d 1323, 1339 (Fed. Cir. 2012)).

First, Hypermedia alleges that “Defendant provides instructions and support to resellers and end-use customers” and then string-cites three webpages relating to only one of the five accused products included in Hypermedia’s inducement allegations, YouTube. ECF 16 ¶¶225-226. Hypermedia makes no allegations supporting alleged inducement for the other four accused products: Google Play Music, Google Video, Google Play Movies, and Android TV. Hypermedia’s induced infringement allegations for those products should therefore be dismissed.

Second, Hypermedia’s inducement allegations for YouTube also fail. Hypermedia cites to: (1) a Google support page for YouTube that provides guidance on the most basic YouTube menu options (*e.g.* Guide, Home, Subscriptions, Trending, History, etc.), and (2) to pages titled “‘Up Next’ videos” and “‘Autoplay’ videos,” each describing how YouTube automatically plays another video after the current one ends. Hypermedia provides no explanation for how these webpages instruct end-users to infringe or advertise the benefits of the eight Inducement Patents.

Courts in this District hold that such passing references to user support documents are “wholly inadequate for an inference of specific intent” to induce infringement. *CAP*, 2015 WL 3945875, at *5. In *CAP*, for example, the court dismissed claims for induced infringement because the complaint failed to allege any statement “that could encourage users to infringe, instead making only ‘passing references’ to ‘user manuals guides, and support articles,’ without ever saying what those materials contain[ed].” *Id.* The court held that these allegations were “wholly inadequate for an inference of specific intent” to induce infringement and therefore dismissed the induced infringement claims. *Id.* Similarly, in *Grobler v. Sony Computer Entertainment America LLC*, the court dismissed induced infringement claims where the plaintiff alleged only that defendant Sony “through its website at <http://www.us.playstation.com/>” “advertises the feature in the Playstation Network” and “provides instructions on how to use the Playstation Network system.” 2013 WL 308937, at *2. Merely pointing to a web address and making conclusory assertions that a defendant “advertises” or “provides instructions” is insufficient to “plausibly show[]” that a defendant “specifically intended” customers to infringe and “knew that the customer’s act constituted infringement.” *Id.*

Similarly, here, Hypermedia’s mere listing of three Google webpages for one accused product, YouTube, is insufficient to allege that Google specifically intended its users to infringe or knew that such acts constituted infringement. Hypermedia’s inducement claims therefore should be dismissed.

VI. DISMISSAL SHOULD BE WITH PREJUDICE AS AMENDMENT WOULD BE FUTILE

Dismissal in this case should be with prejudice. Under Federal Rule of Civil Procedure 15(a), a court need not grant leave to amend where such amendment would be futile. *See, e.g., Pinnacle Brokers Ins. Sols. LLC v. Sentinel Ins. Co., Ltd.*, No. 15-CV-02976-JST, 2015 WL 5159532, at *5 (N.D. Cal. Sept. 2, 2015) (granting motion to dismiss with prejudice where amendment would be futile).

Hypermedia cannot amend its allegations to support claims for willful or induced infringement. First, Hypermedia’s Amended Complaint was filed in response to Google

1 identifying deficiencies regarding these claims in the original Complaint. Hypermedia therefore
2 had the opportunity to address those deficiencies and plead all available facts to try to support
3 pre-suit willful or induced infringement for any of the patents for which it asserts these claims.
4 But the Amended Complaint still fails to support these claims. Because Hypermedia has already
5 had the chance to amend and still could not plead sufficient facts, this Court should deny leave to
6 amend. *See, e.g., Pinnacle Brokers*, 2015 WL 5159532, at *5 (a court may deny leave to amend
7 considering “repeated failure to cure deficiencies by amendments previously allowed”) (quoting
8 *Carvalho v. Equifax Info. Servs., LLC*, 629 F.3d 876, 892 (9th Cir. 2010)); *Boundaries Solutions*
9 *Inc. v. CoreLogic, Inc.*, No. 5:14-cv-00761-PSG, 2014 WL 7463708, at *3 (N.D. Cal. Dec. 30,
10 2014) (“Because [plaintiff] has already had the opportunity to amend and was unable to cure the
11 deficiencies in its pre-suit indirect infringement claim . . . the court finds that further amendment
12 would be futile [and] the claim is dismissed with prejudice”).

13 Second, because all of the patents for which Hypermedia asserts willful and induced
14 infringement expired the day after Hypermedia filed its complaint, Hypermedia cannot plead
15 claims for post-suit willful or induced infringement. *See Clincomp Int’l, Inc. v. Cerner Corp.*,
16 No.: 17cv2479-GPC(BLM), 2018 WL 2229364, at *2-6 (S.D. Cal. May 16, 2018) (dismissing
17 willful and indirect infringement allegations because the plaintiff pled no facts to support
18 defendant’s knowledge of the asserted patent before it expired two weeks prior to the complaint
19 filing). In *Babbage Holdings, LLC v. Activision Blizzard, Inc.*, for example, a district court
20 dismissed plaintiff’s indirect infringement claims where the plaintiff alleged that defendant had
21 knowledge of the asserted patent based on the complaint, but the complaint was not served until
22 after the patent expired. No. 2:13-CV-750, 2014 WL 2115616, at *2 (E.D. Tex. May 15, 2014).
23 Although the plaintiff contended in briefing that defendant received notice letters less than a week
24 before the patent’s expiration, the court dismissed the action because “[plaintiff] is asking this
25 Court to sustain a claim of damages for alleged indirect infringement which lasted three to six
26 days at the maximum. Such damages, if any, are *de minimis* on their face . . . which does not
27 justify or support the use of this Court’s limited resources.” *Id.* Here, Hypermedia cannot even
28 support its willful or indirect infringement claims for a *de minimis* period because its pre-suit

1 letter fails to support such claims for the reasons above, and the Willfulness Patents and
2 Inducement Patents are now expired. In addition, for the '814 Patent, Hypermedia cannot
3 establish even knowledge of the patent for more than a single day before expiration to support its
4 inducement claim.

5 The Court, therefore, should dismiss Hypermedia's willful and induced infringement
6 claims with prejudice.

7 VII. CONCLUSION

8 Google respectfully requests that the Court dismiss with prejudice Hypermedia's willful
9 and induced infringement claims because Hypermedia's Amended Complaint fails to plead facts
10 that could plausibly support Google's pre-suit knowledge of alleged infringement, or that
11 Google's alleged conduct was "egregious" to constitute willful infringement or done with
12 "specific intent" to induce infringement.

13
14 Dated: January 4, 2019

Respectfully submitted,

By: /s/ Melody Drummond Hansen

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Exhibit J

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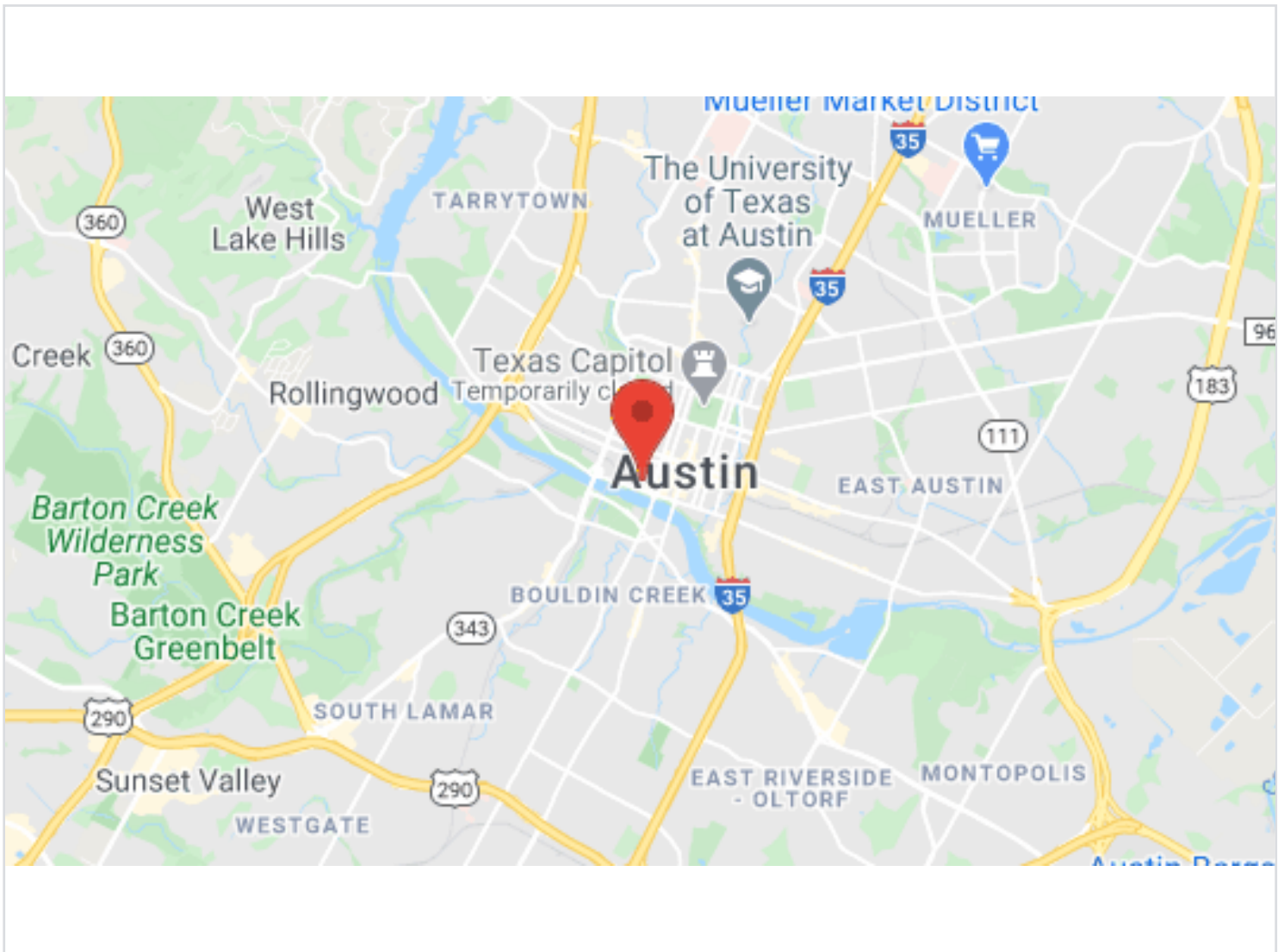
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Exhibit K

Cases Search

31 Results

Parties: begins google Courts: Texas Western District (all districts) Case Status: Active

Case	Case Filing Date ▼
Sonos, Inc. v. Google LLC f/k/a Google Inc. 6-20-cv-00881 (WDTX)	Sep. 29, 2020
Express Mobile, Inc. v. Google LLC 6-20-cv-00804 (WDTX)	Sep. 01, 2020
Richman Technology Corporation v. Google LLC f/k/a Google Inc. 6-20-cv-00769 (WDTX)	Aug. 25, 2020
Alert Signal Intellectual Property, LLC v. Google LLC f/k/a Google Inc. 6-20-cv-00644 (WDTX)	Jul. 16, 2020
WSOU Investments LLC d/b/a Brazos Licensing and Development v. Google LLC f/k/a Google Inc. 6-20-cv-00571 (WDTX)	Jun. 29, 2020
WSOU Investments LLC d/b/a Brazos Licensing and Development v. Google LLC f/k/a Google Inc. 6-20-cv-00572 (WDTX)	Jun. 29, 2020
WSOU Investments LLC d/b/a Brazos Licensing and Development v. Google LLC f/k/a Google Inc. 6-20-cv-00573 (WDTX)	Jun. 29, 2020
WSOU Investments LLC d/b/a Brazos Licensing and Development v. Google LLC f/k/a Google Inc. 6-20-cv-00574 (WDTX)	Jun. 29, 2020
WSOU Investments LLC d/b/a Brazos Licensing and Development v. Google LLC f/k/a Google Inc. 6-20-cv-00575 (WDTX)	Jun. 29, 2020
WSOU Investments LLC d/b/a Brazos Licensing and Development v. Google LLC f/k/a Google Inc. 6-20-cv-00576 (WDTX)	Jun. 29, 2020
WSOU Investments LLC d/b/a Brazos Licensing and Development v. Google LLC f/k/a Google Inc. 6-20-cv-00577 (WDTX)	Jun. 29, 2020
WSOU Investments LLC d/b/a Brazos Licensing and Development v. Google LLC f/k/a Google Inc. 6-20-cv-00578 (WDTX)	Jun. 29, 2020
WSOU Investments LLC d/b/a Brazos Licensing and Development v. Google LLC f/k/a Google Inc. 6-20-cv-00579 (WDTX)	Jun. 29, 2020
WSOU Investments LLC d/b/a Brazos Licensing and Development v. Google LLC f/k/a Google Inc. 6-20-cv-00580 (WDTX)	Jun. 29, 2020
WSOU Investments LLC d/b/a Brazos Licensing and Development v. Google LLC f/k/a Google Inc. 6-20-cv-00581 (WDTX)	Jun. 29, 2020
WSOU Investments LLC d/b/a Brazos Licensing and Development v. Google LLC f/k/a Google Inc. 6-20-cv-00582 (WDTX)	Jun. 29, 2020
WSOU Investments LLC d/b/a Brazos Licensing and Development v. Google LLC f/k/a Google Inc. 6-20-cv-00583 (WDTX)	Jun. 29, 2020
WSOU Investments LLC d/b/a Brazos Licensing and Development v. Google LLC f/k/a Google Inc. 6-20-cv-00584 (WDTX)	Jun. 29, 2020
WSOU Investments LLC d/b/a Brazos Licensing and Development v. Google LLC f/k/a Google Inc. 6-20-cv-00585 (WDTX)	Jun. 29, 2020
Jenam Tech, LLC v. Google LLC 6-20-cv-00453 (WDTX)	Jun. 01, 2020
InfoGation Corporation v. Google LLC f/k/a Google Inc. 6-20-cv-00366 (WDTX)	May. 05, 2020
VoIP-Pal.com, Inc. v. Google LLC f/k/a Google Inc. 6-20-cv-00269 (WDTX)	Apr. 03, 2020
Multipop LLC v. Google LLC f/k/a Google Inc. 6-20-cv-00147 (WDTX)	Feb. 25, 2020
Profectus Technology LLC v. Google LLC f/k/a Google Inc. 6-20-cv-00101 (WDTX)	Feb. 10, 2020
EcoFactor, Inc. v. Google LLC f/k/a Google Inc. 6-20-cv-00075 (WDTX)	Jan. 31, 2020
VideoShare, LLC v. Google LLC et al 6-19-cv-00663 (WDTX)	Nov. 15, 2019
Solas OLED Ltd. v. Google, Inc. 6-19-cv-00515 (WDTX)	Aug. 30, 2019

Parus Holdings Inc. v. Apple Inc. 6-19-cv-00432 (WDTX)	Jul. 22, 2019
Parus Holdings Inc. v. Google LLC 6-19-cv-00433 (WDTX)	Jul. 22, 2019
Hammond Development International, Inc. v. Amazon.Com, Inc. et al 1-20-cv-00342 (WDTX)	Jun. 06, 2019
Hammond Development International, Inc. v. Google LLC 6-19-cv-00356 (WDTX)	Jun. 06, 2019

Exhibit L

Cases Search

20 Results

Parties: begins google Courts: California Northern District (all districts) Case Status: Active

Case	Case Filing Date ▼
Google LLC v. Sonos, Inc. 3-20-cv-06754 (NDCA)	Sep. 28, 2020
Parus Holdings Inc. v. LG Electronics Inc et al. 3-20-cv-05896 (NDCA)	Aug. 21, 2020
Uniloc 2017 LLC et al v. Google LLC 4-20-cv-05330 (NDCA)	Aug. 03, 2020
Uniloc 2017 LLC et al v. Google LLC 4-20-cv-05333 (NDCA)	Aug. 03, 2020
Uniloc 2017 LLC et al v. Google LLC 4-20-cv-05334 (NDCA)	Aug. 03, 2020
Uniloc 2017 LLC et al v. Google LLC 4-20-cv-05339 (NDCA)	Aug. 03, 2020
Uniloc 2017 LLC et al v. Google LLC 4-20-cv-05341 (NDCA)	Aug. 03, 2020
Uniloc 2017 LLC v. Google LLC 4-20-cv-05342 (NDCA)	Aug. 03, 2020
Uniloc 2017 LLC v. Google LLC 4-20-cv-05343 (NDCA)	Aug. 03, 2020
Uniloc 2017 LLC v. Google LLC 4-20-cv-05344 (NDCA)	Aug. 03, 2020
Uniloc 2017 LLC v. Google LLC 4-20-cv-05345 (NDCA)	Aug. 03, 2020
Uniloc 2017 LLC v. Google LLC 4-20-cv-05346 (NDCA)	Aug. 03, 2020
KlausTech LLC v. Google LLC f/k/a Google Inc. 4-20-cv-04459 (NDCA)	Jul. 06, 2020
Uniloc 2017 LLC et al v. Google LLC 4-20-cv-04355 (NDCA)	Jun. 30, 2020
Google LLC f/k/a Google Inc. v. Sonos, Inc. 3-20-cv-03845 (NDCA)	Jun. 11, 2020
In Re Koninklijke Philips Patent Litigation 4-18-cv-01885 (NDCA)	Apr. 03, 2018
Eolas Technologies Incorporated v. Amazon.com, Inc. 4-17-cv-03022 (NDCA)	May. 26, 2017
Eolas Technologies Incorporated v. Google LLC 4-17-cv-01138 (NDCA)	Mar. 06, 2017
Google LLC v. Eolas Technologies Incorporated et al 4-15-cv-05446 (NDCA)	Nov. 25, 2015
Droplets, Inc. v. Amazon.com, Inc., et. al. 4-12-cv-03733 (NDCA)	Jul. 17, 2012

Exhibit M

**UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION**

SOLAS OLED LTD.,

Plaintiff,

v.

DELL INC.,

Defendant.

Case No. 6:19-cv-00514-ADA

SOLAS OLED LTD.,

Plaintiff,

v.

GOOGLE LLC,

Defendant.

Case No. 6:19-cv-00515-ADA

SOLAS OLED LTD.,

Plaintiff,

v.

APPLE INC.,

Defendant.

Case No. 6:19-cv-00537-ADA

SOLAS OLED LTD.,

Plaintiff,

v.

HP INC.,

Defendant.

Case No. 6:19-cv-00631-ADA

SCHEDULING ORDER

In response to the Court orders in the above-captioned cases resetting setting jury selection and trial for April 5, 2021, the Court **ORDERS** that the following schedule will govern deadlines up to and including the trial of these matters:

Proposed Deadline	Item
Thursday, June 25, 2020	Parties file Opening claim construction briefs, including any arguments that any claim terms are indefinite.
Thursday, July 16, 2020	Parties file Responsive claim construction briefs.
Thursday, July 30, 2020	Parties file Reply claim construction briefs.
Friday, July 31, 2020	Parties submit Joint Claim Construction Statement and consolidated briefing collated by Opening, Response, and Reply. Absent agreement of the parties, the Plaintiff shall be responsible for the timely submission of this and other Joint filings. Parties may begin exchanging written discovery and serving third-party subpoenas
Friday, August 14, 2020	Markman Hearing at 9:00 a.m.
Friday, August 21, 2020	Fact Discovery opens; deadline to serve Initial Disclosures per Rule 26(a).
Friday, September 11, 2020	Deadline to add parties.
Friday, September 18, 2020	Deadline to serve Final Infringement and Invalidity Contentions.
Friday, September 25, 2020	Deadline to amend pleadings. A motion is not required unless the amendment adds patents or claims.
Friday, November 20, 2020	Close of Fact Discovery.
Tuesday, November 24, 2020	Opening Expert Reports.
Wednesday, December 23, 2020	Rebuttal Expert Reports.
Wednesday, January 20, 2021	Close of Expert Discovery.

Proposed Deadline	Item
Friday, January 22, 2021	Deadline to meet and confer to discuss narrowing the number of claims asserted and prior art references at issue. The parties shall file a report within 5 business days regarding the results of the meet and confer.
Friday, January 29, 2021	Dispositive motion deadline and <i>Daubert</i> motion deadline.
Wednesday, February 17, 2021	Serve Pretrial Disclosures (jury instructions, exhibits lists, witness lists, discovery and deposition designations).
Wednesday, February 24, 2021	Serve objections to pretrial disclosures/rebuttal disclosures.
Wednesday, March 3, 2021	Serve objections to rebuttal disclosures and File Motions <i>in limine</i> .
Wednesday, March 10, 2021	File Joint Pretrial Order and Pretrial Submissions (jury instructions, exhibits lists, witness lists, discovery and deposition designations); file oppositions to motions <i>in limine</i> .
Friday, March 12, 2021	Deadline to meet and confer regarding remaining objections and disputes on motions <i>in limine</i> .
Monday, March 15, 2021	File joint notice identifying remaining objections to pretrial disclosures and disputes on motions <i>in limine</i> .
Wednesday, March 17, 2021	Final Pretrial Conference. The Court expects to set the Pretrial Conference within 2-4 weeks of the trial date.
Monday, April 5, 2021	Jury Selection/Trial.

SIGNED this day of June 21, 2020.


 ALAN D A LBRIGHT
 UNITED STATES DISTRICT JUDGE

Exhibit N

**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION**

INTELLECTUAL TECH LLC,

Plaintiff.

v.

ZEBRA TECHNOLOGIES
CORPORATION,

Defendant.

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CIVIL ACTION NO. 6:19-cv-00628-ADA
JURY TRIAL DEMANDED

SCHEDULING ORDER

DEADLINE	ITEM
By party agreement January 20, 2020	Plaintiff serves preliminary ¹ infringement contentions in the form of a chart setting forth where in the accused product(s) each element of the asserted claim(s) are found. Plaintiff shall also identify the earliest priority date (<i>i.e.</i> the earliest date of invention) for each asserted claim and produce: (1) all documents evidencing conception and reduction to practice for each claimed invention, and (2) a copy of the file history for each patent in suit.
2 weeks after CMC January 29, 2020	Deadline for Motions to Transfer
By party agreement March 18, 2020	Defendant serves preliminary invalidity contentions in the form of (1) a chart setting forth where in the prior art references each element of the asserted claim(s) are found, (2) an identification of any limitations the Defendant contends are indefinite or lack written description under section 112, and (3) an identification of any claims the Defendant contends are directed to ineligible subject matter under section 101. Defendant shall also produce

¹ The parties may amend preliminary infringement contentions and preliminary invalidity contentions without leave of court so long as counsel certifies that it undertook reasonable efforts to prepare its preliminary contentions and the amendment is based on material identified after those preliminary contentions were served and should do so seasonably upon identifying any such material. Any amendment to add claims requires leave of court so that the Court can address any scheduling issues.

DEADLINE	ITEM
	(1) all prior art referenced in the invalidity contentions, (2) technical documents, including software where applicable, sufficient to show the operation of the accused product(s), and (3) summary, annual sales information for the accused product(s) for the prior two years, unless the parties agree to some other timeframe.
9 weeks after CMC March 18, 2020	Parties exchange claim terms for construction.
11 weeks after CMC April 01, 2020	Parties exchange proposed claim constructions.
12 weeks after CMC April 08, 2020	Parties disclose extrinsic evidence. The parties shall disclose any extrinsic evidence, including the identity of any expert witness they may rely upon with respect to claim construction or indefiniteness. With respect to any expert identified, the parties shall also provide a summary of the witness's expected testimony including the opinions to be expressed and a general description of the basis and reasons therefore. A failure to summarize the potential expert testimony in a good faith, informative fashion may result in the exclusion of the proffered testimony. With respect to items of extrinsic evidence, the parties shall identify each such item by production number or produce a copy of any such item if not previously produced.
13 weeks after CMC April 15, 2020	Deadline to meet and confer to narrow terms in dispute and exchange revised list of terms/constructions.
14 weeks after CMC April 22, 2020	Parties file Opening claim construction briefs, including any arguments that any claim terms are indefinite.
17 weeks after CMC May 13, 2020	Parties file Responsive claim construction briefs.
19 weeks after CMC May 27, 2020	Parties file Reply claim construction briefs.

DEADLINE	ITEM
20 weeks after CMC June 03, 2020	Parties submit Joint Claim Construction Statement and consolidated briefing collated by Opening, Response, and Reply in Microsoft Word format. Absent agreement of the parties, the Plaintiff shall be responsible for the timely submission of this and other Joint filings.
23 weeks after CMC (or as soon as practicable) June 12, 2020	Markman Hearing at [9:00 a.m. or 1:00 p.m.]
1 week after Markman hearing June 19, 2020	Fact Discovery opens; deadline to serve Initial Disclosures per Rule 26(a).
6 weeks after Markman hearing July 24, 2020	Deadline to add parties.
8 weeks after Markman hearing August 7, 2020	Deadline to serve Final Infringement and Invalidity Contentions.
12 weeks after Markman hearing September 4, 2020	Deadline to amend pleadings. A motion is not required unless the amendment adds patents or claims.
24 weeks after Markman hearing November 25, 2020	Close of Fact Discovery.
25 weeks after Markman hearing December 4, 2020	Opening Expert Reports.
29 weeks after Markman hearing January 8, 2021	Rebuttal Expert Reports.

DEADLINE	ITEM
32 weeks after Markman hearing January 22, 2021	Close of Expert Discovery.
33 weeks after Markman hearing January 29, 2021	Deadline to meet and confer to discuss narrowing the number of claims asserted and prior art references at issue. The parties shall file a report within 5 business days regarding the results of the meet and confer.
34 weeks after Markman hearing February 5, 2021	Dispositive motion deadline and <i>Daubert</i> motion deadline.
36 weeks after Markman hearing February 19, 2021	Serve Pretrial Disclosures (jury instructions, exhibits lists, witness lists, discovery and deposition designations).
38 weeks after Markman hearing March 5, 2021	Serve objections to pretrial disclosures/rebuttal disclosures.
39 weeks after Markman hearing March 12, 2021	Serve objections to rebuttal disclosures and File Motions <i>in limine</i> .
40 weeks after Markman hearing March 19, 2021	File Joint Pretrial Order and Pretrial Submissions (jury instructions, exhibits lists, witness lists, discovery and deposition designations); file oppositions to motions <i>in limine</i>
41 weeks after Markman hearing March 26, 2021	Deadline to meet and confer regarding remaining objections and disputes on motions <i>in limine</i> .
7 business days before Final Pretrial Conference, by party agreement. April 2, 2021	File joint notice identifying remaining objections to pretrial disclosures and disputes on motions <i>in limine</i> .

DEADLINE	ITEM
43 weeks after Markman hearing (or as soon as practicable) April 9, 2021	Final Pretrial Conference. The Court expects to set the Pretrial Conference within 2-4 weeks of the trial date.
44-47 weeks after Markman hearing (or as soon as practicable) April 19, 2021 – May 10, 2021	Jury Selection/Trial. The Court expects to set this date at the conclusion of the <i>Markman</i> Hearing.

SIGNED this 2nd day of February, 2020.

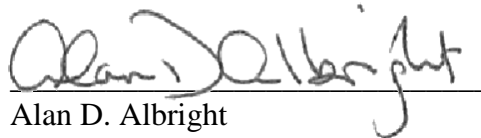

Alan D. Albright
United States District Judge

Exhibit O

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN JOSE DIVISION

USB TECHNOLOGIES, LLC,

Plaintiff,

v.

SUNVALLEYTEK INTERNATIONAL,
INC., et al.,

Defendants.

Case No. 17-CV-03869-LHK

CASE MANAGEMENT ORDER

Plaintiff's Attorney(s): Jayson Sohi
Defendants' Attorney(s): Kimberly Donovan

An initial case management conference was held on October 11, 2017. A further case management conference is set for January 17, 2018, at 2:00 p.m. The parties shall file their joint case management statement by January 10, 2018.

The Court GRANTS Plaintiff's motion to voluntarily dismiss without prejudice Defendant Hootoo.com, Inc.

The parties shall exchange initial disclosures by October 16, 2017.

The parties shall file a stipulation and proposed order regarding e-discovery by October 25, 2017.

The parties' stipulation that "each of the parties shall be entitled to up to three (3) expert witnesses" (ECF No. 23 at 6) is GRANTED.

The parties shall contact the Court's ADR program on October 11, 2017 to request a mediator. The parties shall file a joint settlement status report by January 2, 2018.

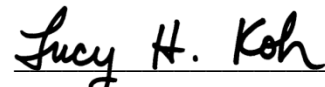
The Court set the following case schedule:

Scheduled Event	Date
Deadline to Serve Infringement Contentions and Accompanying Production	November 8, 2017
Last Day to Amend the Pleadings/Add Parties	December 11, 2017
Deadline to Complete Mediation	December 22, 2017
Deadline to Serve Invalidity Contentions and Accompanying Production	January 5, 2018
Deadline to Exchange Terms for Construction	January 19, 2018
Deadline to Exchange Preliminary Constructions and Extrinsic Evidence	February 9, 2018
Deadline to Serve Damages Contentions	February 16, 2018
Deadline to File a Joint Claim Construction and Prehearing Statement	March 2, 2018
Deadline to serve Responsive Damages Contentions	March 16, 2018
Deadline to Complete Claim Construction Discovery	March 30, 2018
Claim Construction Briefing	Pl.'s Op.: April 16, 2018 Def's Resp.: April 30, 2018 Pl's Reply: May 7, 2018
Claim Construction Hearing	May 24, 2018
Close of Fact Discovery	August 31, 2018
Opening Expert Reports	September 21, 2018
Rebuttal Expert Reports	October 12, 2018
Close of Expert Discovery	November 2, 2018
Last Day to File Dispositive Motions (one per side in the entire case)	November 16, 2018
Hearing on Dispositive Motions	January 17, 2019, at 1:30 p.m.
Final Pretrial Conference	April 25, 2019, at 1:30 p.m.

Jury Trial	May 20, 2019, at 9:00 a.m.
Length of Trial	4 days

IT IS SO ORDERED.

Dated: October 11, 2017


 LUCY H. KOH
 United States District Judge

United States District Court
 Northern District of California

Exhibit P

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Attorneys for Defendants Sandoz Inc., Sandoz GmbH, Sandoz International GmbH, and Lek Pharmaceuticals, d.d.

*Attorneys for Plaintiffs Amgen Inc.
 and Amgen Manufacturing, Limited*

**UNITED STATES DISTRICT COURT
 NORTHERN DISTRICT OF CALIFORNIA**

AMGEN INC. and
 AMGEN MANUFACTURING, LIMITED,

Plaintiffs,

v.

SANDOZ INC., SANDOZ
 INTERNATIONAL GMBH, and
 SANDOZ GMBH,

Defendants.

AMGEN INC. and AMGEN
 MANUFACTURING, LIMITED,

Plaintiffs,

v.

SANDOZ INC. SANDOZ
 INTERNATIONAL GMBH, SANDOZ
 GMBH, and LEK PHARMACEUTICALS,
 D.D.,

Defendants.

Case No. 3:14-cv-04741-RS

Case No. 3:16-cv-02581-RS

**STIPULATION AND SCHEDULING
 ORDER (AS MODIFIED BY THE
 COURT)**

Pursuant to Civil Local Rule 7-12, Plaintiffs Amgen Inc. and Amgen Manufacturing, Limited (“Amgen”) and Defendants Sandoz Inc., Sandoz International GmbH, Sandoz GmbH, and Lek Pharmaceuticals, d.d. through their undersigned counsel, hereby stipulate as follows:

WHEREAS, the Court entered an order setting the schedule through trial (-04741 Dkt. No. 253, -02581 Dkt. No. 87);

WHEREAS, the Court entered an order that modified certain expert discovery dates but otherwise did not modify the schedule through trial (-04741 Dkt. No. 259, -02581 Dkt. No. 90);

WHEREAS, the Court issued a notice rescheduling the hearing date for dispositive motions but otherwise did not modify the schedule through trial (-04741 Dkt. No. 285, -02581 Dkt. No. 123);

WHEREAS, there have been no other scheduling modifications since the Court entered the order setting the schedule through trial (-04741 Dkt. No. 253, -02581 Dkt. No. 87);

WHEREAS, the Parties desire to move certain pre-trial deadlines closer to the scheduled trial date while still tracking the schedule set forth in the document entitled “Guidelines for Final Pretrial Conference in Jury Cases Before District Judge Richard Seeborg”;

WHEREAS, the Parties desire to add deadlines for *Daubert* motions to the case schedule;

NOW, THEREFORE, the parties hereby jointly request the modified schedule as set forth below.

Proposed Revised Schedule

**Amgen v. Sandoz, Case No. 3:14-cv-04741-RS (N.D. Cal.)
Amgen v. Sandoz, Case No. 3:16-cv-02581-RS (N.D. Cal.)**

Description	Current Date from Court’s Scheduling Order	Parties’ Proposed Date
Dispositive Motion Responsive Briefs	11/13/2017	11/13/2017 (Unchanged)
Dispositive Motion Reply Briefs	11/21/2017	11/21/2017 (Unchanged)

Description	Current Date from Court's Scheduling Order	Parties' Proposed Date
Dispositive Motion Hearing	12/18/2017	12/18/2017 (Unchanged)
<i>Daubert</i> Motion Opening Briefs	N/A	1/19/2018
<i>Daubert</i> Motion Responsive Briefs	N/A	2/2/2018
<i>Daubert</i> Motion Reply Briefs	N/A	2/9/2018
Pretrial Meet and Confer [21 Days prior to the final Pretrial Conference; Judge Seeborg Guidelines, ¶ A]	12/20/2017	2/8/2018
Joint Pretrial Statement and Order, Pretrial Exchanges, and Motions in Limine [10 days prior to the final Pretrial Conference; Judge Seeborg Guidelines, ¶¶ B, D]	1/16/2018	2/19/2018
Jury Voir Dire Questions, Proposed Jury Instructions, and Proposed Jury Verdict Forms [5 days prior to the final Pretrial Conference; Judge Seeborg Guidelines, ¶ D]	1/23/2018	2/24/2018
Oppositions to Motions in Limine [3 days prior to final Pretrial Conference; Judge Seeborg Guidelines, ¶¶ B, D]	1/25/2018	2/26/2018
Pretrial Conference and <i>Daubert</i> Motion Hearing	1/30/2018	3/1/2018
Optional Trial Briefs, Deposition and Discovery Designations [5 days prior to Trial; Judge Seeborg Guidelines, ¶ D]	1/31/2018	3/21/2018
Trial	3/26/2018	3/26/2018 (Unchanged)

Respectfully submitted,

Dated: November 22, 2017

By: /s/ Nicholas Groombridge

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Attorneys for Amgen Inc. and Amgen Manufacturing, Ltd.

Dated: November 22, 2017

By: /s/ Erik J. Olson

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Attorneys for Defendants Sandoz Inc., Sandoz GmbH, Sandoz International GmbH, and Lek Pharmaceuticals, d.d.

SIGNATURE ATTESTATION

Pursuant to Civil Local Rule 5-1(i)(3), I hereby certify that concurrence in the filing of this document has been obtained from each of the other Signatories shown above.


Dated: November 22, 2017

By: /s/ Erik J. Olson

Erik J. Olson

1 **PURSUANT TO STIPULATION, IT IS SO ORDERED.**

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3 Dated: 11/22/2017

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6 THE HONORABLE RICHARD SEEBORG
7 UNITED STATES DISTRICT COURT JUDGE
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ADDITIONAL COUNSEL

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*Attorneys for Defendants Sandoz Inc., Sandoz
GmbH, Sandoz International GmbH, and Lek
Pharmaceuticals, d.d.*

Exhibit Q

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

GENERAL ORDER No. 72

IN RE: Coronavirus Disease Public Health Emergency

WHEREAS, the President of the United States has declared a National Emergency in response to the COVID-19 (Coronavirus Disease) outbreak;

WHEREAS, the Governor of the State of California has declared a State of Emergency in response to the COVID-19 outbreak;

WHEREAS, the Centers for Disease Control and Prevention (CDC) has recommended that throughout the United States of America, for an eight-week period, organizations cancel or postpone in-person events consisting of 50 people or more;

WHEREAS, local public health departments have recommended that large gatherings be avoided, that elderly and other vulnerable populations avoid person-to-person contact, and that employers allow employees to telework to the extent practical;

WHEREAS, the six Bay Area counties have announced a shelter in place order directing everyone to stay inside their homes and away from others as much as possible for the next three weeks as public health officials try to curb the rapid spread of coronavirus across the region;

WHEREAS, the Judges of the United States District Court, Northern District of California, have considered and extensively discussed the various interests implicated by the COVID-19 (Coronavirus Disease) outbreak and any court response to the outbreak, including: the health of jurors, witnesses, parties, attorneys, the public, court staff, Probation and Pretrial Services staff, chambers staff, and judges; the constitutional rights of criminal defendants and other parties; and the public's interest in, and the court's duty to ensure, the effective and expeditious administration of justice;

NOW THEREFORE, the United States District Court, Northern District of California, hereby issues the following Order, effective immediately:

Civil Cases:

1. No jury trial will be commenced before May 1, 2020. Any trial dates currently scheduled during that period are vacated.
2. All civil matters will be decided on the papers, or if the assigned judge believes a hearing is necessary, the hearing will be by telephone or videoconference. This applies to motion hearings, case management conferences, pretrial conferences, settlement conferences and Alternative Dispute Resolution ("ADR") proceedings. See the assigned judge's scheduling notes for specific instructions on telephone/video appearances, or the [ADR webpage](#).

Criminal Cases:

Due to the Court's reduced ability to obtain an adequate spectrum of jurors and the effect of the above public health recommendations on the availability of counsel and court staff to be present in the courtroom, the time period of the continuances implemented by this General Order will be excluded under the Speedy Trial Act, as the Court specifically finds that the ends of justice served by ordering the continuances outweigh the interest of the public and any defendant's right to a speedy trial pursuant to 18 U.S.C. section 3161(h)(7)(A). Accordingly,

1. No jury trial will be commenced before May 1, 2020. Any trial dates currently scheduled during that period are vacated.
2. Initial appearances and other proceedings before the magistrate judges, will continue, but will be consolidated and such proceedings for all divisions will be conducted in San Francisco, and where possible, will be conducted by telephone or by videoconference. New arrestees shall be booked at Santa Rita Jail and produced for court the following day instead of being presented for booking at the U.S. Marshals Service lockup.
3. Appearances before the district judges may be waived or postponed, if required by law, with the defendant's consent.
4. To the extent possible, after lodging/filing an application to enter an open guilty plea or a plea agreement, guilty pleas and sentencing shall be consolidated for a date after the presentence report has been prepared.
5. All grand jury proceedings in this district are suspended until May 1, 2020.
6. Case-by-case exceptions to any of these procedures may be ordered for non-jury matters at the discretion of the Court after consultation with counsel.

Other:

1. The Civil Local Rule 5-1 requirement for provision of a courtesy copy of all filings to the chambers of the assigned judge, applicable to both civil and criminal cases, is suspended pending further notice.
2. This General Order supersedes any previous information included in standing orders or scheduling notes related to COVID-19.
3. The courthouse and law library are closed for public events, tours, and visits.

ADOPTED: March 16, 2020

FOR THE COURT:



PHYLLIS HAMILTON
CHIEF JUDGE

Exhibit R

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

GENERAL ORDER No. 72-6

IN RE: Coronavirus Disease Public Health Emergency

WHEREAS, the COVID-19 (Coronavirus Disease) outbreak remains a national public health emergency;

WHEREAS, the Judges of the United States District Court for the Northern District of California continue to balance the various interests implicated by the COVID-19 public health emergency; and

WHEREAS, the Judges of the United States District Court for the Northern District of California have determined that the public safety will be best served by limiting the permissible in-court proceedings in accordance with the logistical considerations necessitated by the Court's safety protocols;

NOW THEREFORE, the United States District Court, Northern District of California, hereby Orders as follows, effective immediately:

Civil Cases:

1. Jury trials and bench trials may proceed in accordance with the logistical considerations necessitated by the Court's safety protocols.
2. Each judge will determine whether to hold a hearing or decide a civil matter on the papers. Hearings will be held via telephone or videoconference. This applies to motion hearings, case management conferences, pretrial conferences, settlement conferences, and Alternative Dispute Resolution ("ADR") proceedings. For specific instructions on telephone or video appearances, see the docket on PACER, the assigned judge's schedule of upcoming proceedings (located on each judge's web page at cand.uscourts.gov/judges), or the [ADR webpage](#).

Criminal Cases:

1. Jury trials may proceed in accordance with the logistical considerations necessitated by the Court's safety protocols.
2. Initial appearances and other proceedings before the magistrate judges will be conducted by telephone or by videoconference. New arrestees shall be booked at Santa Rita Jail and produced for court appearance the following day instead of being presented for booking at the U.S. Marshals Service lockup.
3. Other court appearances may be waived or postponed, or may be conducted by telephone or videoconference. See [General Order 74](#) for procedures pursuant to the Coronavirus Aid, Relief, and Economic Security Act ("CARES Act"). A limited number of in-court proceedings are permitted.
4. To the extent possible, after lodging/filing an application to enter an open guilty plea or a plea agreement, guilty pleas and sentencing shall be consolidated for a date after the presentence report has been prepared.

Other:

1. All local rules requiring that a courtesy copy be provided to the chambers of the assigned judge are suspended pending further notice, unless a judge orders otherwise in a specific case.
2. The requirement under Civil Local Rule 5-1(b) that a pro se party must request permission from the assigned judge to use the court's Electronic Case Filing (ECF) system is suspended pending further notice.
3. Pending further notice, the courthouses and law libraries are closed for public events, tours, and visits.
4. Effective immediately, this General Order supersedes General Order 72-5.

ADOPTED: September 16, 2020

FOR THE COURT:

A handwritten signature in black ink, appearing to read 'Phyllis J. Hamilton', is written over a horizontal line.

Phyllis J. Hamilton
Chief Judge

Exhibit S

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

GENERAL ORDER No. 72-2

IN RE: Coronavirus Disease Public Health Emergency

WHEREAS, the President of the United States has declared a National Emergency in response to the COVID-19 (Coronavirus Disease) outbreak;

WHEREAS, the Governor of the State of California has declared a State of Emergency and ordered a state-wide shelter-in-place;

WHEREAS, the Centers for Disease Control and Prevention (CDC) has recommended nationwide that people work or study from home to the extent possible and avoid gatherings;

WHEREAS, local public health departments have issued shelter-in-place orders; and

WHEREAS, the Judges of the United States District Court for the Northern District of California find that the current guidance of local and national public health officials requires that courthouses remain closed in order to protect the public health and reduce the size of public gatherings and unnecessary travel;

NOW THEREFORE, the United States District Court, Northern District of California, hereby issues the following Order, effective immediately:

Civil Cases:

1. No jury trial will be conducted before June 1, 2020. Any trial dates currently scheduled during that period will be postponed or vacated.
2. All civil matters will be decided on the papers, or if the assigned judge believes a hearing is necessary, the hearing will be by telephone or videoconference. This applies to motion hearings, case management conferences, pretrial conferences, settlement conferences, and Alternative Dispute Resolution ("ADR") proceedings. For specific instructions on telephone or video appearances, see the docket on PACER, the assigned judge's schedule of upcoming proceedings (located on each judge's web page at cand.uscourts.gov/judges), or the [ADR webpage](#).

Criminal Cases:

Due to the Court's reduced ability to obtain an adequate spectrum of jurors and the effect of the above public health recommendations on the availability of counsel and court staff to be present in the courtroom:

1. No jury trial will be conducted before June 1, 2020. Any jury trials currently scheduled to commence during that period will be postponed or vacated.
2. Each judge assigned to a criminal trial scheduled before June 1, 2020 will make appropriate findings and enter an order tolling time under the Speedy Trial Act.
3. Initial appearances and other proceedings before the magistrate judges will continue and will be conducted by telephone or by videoconference. New arrestees shall be booked at Santa Rita Jail and produced for court appearance the following day instead of being presented for booking at the U.S. Marshals Service lockup.
4. Appearances before the district judges may be waived or postponed, or may be conducted by telephone or videoconference. See [General Order 74](#) for procedures pursuant to the Coronavirus Aid, Relief, and Economic Security Act ("CARES Act").
5. To the extent possible, after lodging/filing an application to enter an open guilty plea or a plea agreement, guilty pleas and sentencing shall be consolidated for a date after the presentence report has been prepared.
6. All grand jury proceedings in this district are suspended until June 1, 2020.
7. Case-by-case exceptions to any of these procedures may be ordered for non-jury matters at the discretion of the assigned judge.

Other:

1. All local rules requiring that a courtesy copy be provided to the chambers of the assigned judge are suspended pending further notice.
2. The requirement under Civil Local Rule 5-1(b) that a pro se party must request permission from the assigned judge to use the court's Electronic Case Filing (ECF) system is suspended pending further notice.
3. To the extent that any standing orders or scheduling notes conflict with this General Order, this General Order shall control.
4. Pending further notice, the courthouses and law libraries are closed for public events, tours, and visits.
5. Effective May 1, 2020, this General Order supersedes General Order 72.

ADOPTED: April 30, 2020

FOR THE COURT:

A handwritten signature in black ink, appearing to read 'Phyllis J. Hamilton', is written over a horizontal line.

Phyllis J. Hamilton
Chief Judge

Exhibit T

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

GENERAL ORDER No. 72-3

IN RE: Coronavirus Disease Public Health Emergency

WHEREAS, the COVID-19 (Coronavirus Disease) outbreak remains a national public health emergency; and the Judges of the United States District Court for the Northern District of California continue to balance the various interests implicated by the COVID-19 public health emergency, and find that the current guidance of public health officials allows for a modification in court operations to permit the resumption of limited in-court proceedings;

NOW THEREFORE, the United States District Court, Northern District of California, hereby issues the following Order, effective immediately:

Civil Cases:

1. No new jury trial will be conducted through September 30, 2020. Any jury trial dates currently scheduled to commence during that period will be postponed or vacated. However, individual judges may offer bench trials by videoconference in lieu of postponement.
2. Through September 30, 2020, all civil matters will be decided on the papers, or if the assigned judge believes a hearing is necessary, the hearing will be by telephone or videoconference. This applies to motion hearings, case management conferences, pretrial conferences, settlement conferences, Alternative Dispute Resolution ("ADR") proceedings, and bench trials. For specific instructions on telephone or video appearances, see the docket on PACER, the assigned judge's schedule of upcoming proceedings (located on each judge's web page at cand.uscourts.gov/judges), or the [ADR webpage](#).

Criminal Cases:

1. No new jury trial will be conducted through June 30, 2020. Any jury trials currently scheduled to commence during that period will be postponed or vacated.
2. Each judge assigned to a criminal trial scheduled before July 1, 2020 will make appropriate findings and enter an order tolling time under the Speedy Trial Act.
3. Initial appearances and other proceedings before the magistrate judges will continue and will be conducted by telephone or by videoconference. New arrestees shall be booked at Santa Rita Jail and produced for court appearance the following day instead of being presented for booking at the U.S. Marshals Service lockup.
4. Appearances before the district judges may be waived or postponed, or may be conducted by telephone or videoconference. See [General Order 74](#) for procedures pursuant to the Coronavirus Aid, Relief, and Economic Security Act ("CARES Act"). For the month of June, in-court proceedings are permitted only for 1) guilty pleas, 2) sentencings, and 3) evidentiary hearings requiring witness testimony (such as motions to suppress or supervised release evidentiary hearings). This applies to both in-custody and out-of-custody defendants.
5. To the extent possible, after lodging/filing an application to enter an open guilty plea or a plea agreement, guilty pleas and sentencing shall be consolidated for a date after the presentence report has been prepared.
6. Grand jury proceedings in this district will resume in June on a date and in a manner to be determined.

Other:

1. All local rules requiring that a courtesy copy be provided to the chambers of the assigned judge are suspended pending further notice, unless a judge orders otherwise in a specific case.
2. The requirement under Civil Local Rule 5-1(b) that a pro se party must request permission from the assigned judge to use the court's Electronic Case Filing (ECF) system is suspended pending further notice.
3. Pending further notice, the courthouses and law libraries are closed for public events, tours, and visits.
4. Effective immediately, this General Order supersedes General Order 72-2.

ADOPTED: May 21, 2020

FOR THE COURT:

A handwritten signature in black ink, appearing to read 'Phyllis J. Hamilton', is written over a horizontal line.

Phyllis J. Hamilton
Chief Judge

Exhibit U

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

GENERAL ORDER No. 72-4

IN RE: Coronavirus Disease Public Health Emergency

WHEREAS, the COVID-19 (Coronavirus Disease) outbreak remains a national public health emergency; and the Judges of the United States District Court for the Northern District of California continue to balance the various interests implicated by the COVID-19 public health emergency, and find that the current guidance of public health officials allows for a modification in court operations to permit the resumption of limited in-court proceedings;

NOW THEREFORE, the United States District Court, Northern District of California, hereby issues the following Order, effective immediately:

Civil Cases:

1. No new jury trial will be conducted through September 30, 2020. Any jury trial dates currently scheduled to commence during that period will be postponed or vacated. However, individual judges may offer bench trials by videoconference in lieu of postponement.
2. Through September 30, 2020, all civil matters will be decided on the papers, or if the assigned judge believes a hearing is necessary, the hearing will be by telephone or videoconference. This applies to motion hearings, case management conferences, pretrial conferences, settlement conferences, Alternative Dispute Resolution (“ADR”) proceedings, and bench trials. For specific instructions on telephone or video appearances, see the docket on PACER, the assigned judge’s schedule of upcoming proceedings (located on each judge’s web page at cand.uscourts.gov/judges), or the [ADR webpage](#).

Criminal Cases:

1. Commencing July 1, 2020, a limited number of jury trials are permitted at the court’s discretion.
2. Initial appearances and other proceedings before the magistrate judges will continue and will be conducted by telephone or by videoconference. New arrestees shall be booked at Santa Rita Jail and produced for court appearance the following day instead of being presented for booking at the U.S. Marshals Service lockup.
3. Appearances before the district judges may be waived or postponed, or may be conducted by telephone or videoconference. See [General Order 74](#) for procedures pursuant to the Coronavirus Aid, Relief, and Economic Security Act (“CARES Act”). Commencing July 1, 2020, a limited number of in-court proceedings, other than status conferences, are permitted. This applies to both in-custody and out-of-custody defendants.
4. To the extent possible, after lodging/filing an application to enter an open guilty plea or a plea agreement, guilty pleas and sentencing shall be consolidated for a date after the presentence report has been prepared.

Other:


1. All local rules requiring that a courtesy copy be provided to the chambers of the assigned judge are suspended pending further notice, unless a judge orders otherwise in a specific case.
2. The requirement under Civil Local Rule 5-1(b) that a pro se party must request permission from

the assigned judge to use the court's Electronic Case Filing (ECF) system is suspended pending further notice.

3. Pending further notice, the courthouses and law libraries are closed for public events, tours, and visits.
4. Effective immediately, this General Order supersedes General Order 72-3.

ADOPTED: June 24, 2020

FOR THE COURT:

A handwritten signature in black ink, appearing to read 'Phyllis J. Hamilton', is written over a horizontal line.

Phyllis J. Hamilton
Chief Judge

Exhibit V

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

GENERAL ORDER No. 72-5

IN RE: Coronavirus Disease Public Health Emergency

WHEREAS, the COVID-19 (Coronavirus Disease) outbreak remains a national public health emergency;

WHEREAS, the Judges of the United States District Court for the Northern District of California continue to balance the various interests implicated by the COVID-19 public health emergency; and

WHEREAS, the Judges of the United States District Court for the Northern District of California have determined that, due to a recent increase in COVID-19 cases and in light of the current guidance of public health agencies, the public safety will be best served by limiting the permissible in-court criminal proceedings to ten people, which necessarily precludes jury trials;

NOW THEREFORE, the United States District Court, Northern District of California, hereby issues the following Order, effective immediately:

Civil Cases:

1. No new jury trial will be conducted through September 30, 2020. Any jury trial currently scheduled to commence before October 1, 2020, will be postponed or vacated. However, individual judges may offer bench trials by videoconference in lieu of postponement.
2. Through September 30, 2020, all civil matters will be decided on the papers, or if the assigned judge believes a hearing is necessary, the hearing will be by telephone or videoconference. This applies to motion hearings, case management conferences, pretrial conferences, settlement conferences, Alternative Dispute Resolution ("ADR") proceedings, and bench trials. For specific instructions on telephone or video appearances, see the docket on PACER, the assigned judge's schedule of upcoming proceedings (located on each judge's web page at cand.uscourts.gov/judges), or the [ADR webpage](#).

Criminal Cases:

1. No new jury trial will be conducted through September 30, 2020. Any jury trial currently scheduled to commence before October 1, 2020, will be postponed or vacated.
2. Initial appearances and other proceedings before the magistrate judges will be conducted by telephone or by videoconference. New arrestees shall be booked at Santa Rita Jail and produced for court appearance the following day instead of being presented for booking at the U.S. Marshals Service lockup.
3. Other court appearances may be waived or postponed, or may be conducted by telephone or videoconference. See [General Order 74](#) for procedures pursuant to the Coronavirus Aid, Relief, and Economic Security Act ("CARES Act"). A limited number of in-court proceedings are permitted, with a limit of 10 people present in the courtroom at one time.
4. To the extent possible, after lodging/filing an application to enter an open guilty plea or a plea agreement, guilty pleas and sentencing shall be consolidated for a date after the presentence

report has been prepared.

Other:

1. All local rules requiring that a courtesy copy be provided to the chambers of the assigned judge are suspended pending further notice, unless a judge orders otherwise in a specific case.
2. The requirement under Civil Local Rule 5-1(b) that a pro se party must request permission from the assigned judge to use the court's Electronic Case Filing (ECF) system is suspended pending further notice.
3. Pending further notice, the courthouses and law libraries are closed for public events, tours, and visits.
4. Effective immediately, this General Order supersedes General Order 72-4.

ADOPTED: July 23, 2020

FOR THE COURT:

A handwritten signature in black ink, appearing to read 'Phyllis J. Hamilton', is written over a horizontal line.

Phyllis J. Hamilton
Chief Judge

Exhibit W

FILED

MAR 12 2020

CLERK, U.S. DISTRICT COURT,
WESTERN DISTRICT OF TEXAS
BY Myra
DEPUTY CLERK

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

STANDING ORDER REGARDING CORONAVIRUS (COVID-19) AND COURT
PROCEEDINGS

If any party or counsel finds that a hearing, deposition, mediation, or trial may cause a person to travel or act contrary to official guidance or precautions regarding the COVID-19 virus, the party or counsel shall timely request to postpone the relevant hearing, deposition, mediation, or trial or allow it by teleconference, videoconference, or other method. If the parties cannot reach an agreement, any party may bring their request to the Court by phone or written request.

The Court plans, as of now, to proceed with in-person Markman hearings as previously scheduled. If any party or counsel believes an alternative arrangement is necessary, the party or counsel shall confer with the opposing party or parties regarding the appropriate means to accommodate the request. For example, a client restricted from traveling may be able to participate in the Markman via videoconference. If the parties cannot reach an agreement, they may bring to the Court a timely request for accommodation. The Court will consider postponing the Markman hearing only if it is convinced that no other alternative arrangement is satisfactory.

This Order shall immediately apply to all cases assigned to the undersigned and Magistrate Judge Jeffrey C. Manske, and shall remain in effect until further order of the Court.

SIGNED this 12th day of March, 2020.



ALAN D ALBRIGHT
UNITED STATES DISTRICT JUDGE

Exhibit X

**U.S. District Court [LIVE]
Western District of Texas (Waco)
CIVIL DOCKET FOR CASE #: 6:18-cv-00308-ADA**

MV3 Partners LLC v. Roku, Inc.
Assigned to: Judge Alan D Albright
Cause: 35:271 Patent Infringement


Date Filed: 10/16/2018
Jury Demand: Plaintiff
Nature of Suit: 830 Patent
Jurisdiction: Federal Question

04/02/2020	170	Opposed MOTION to Continue <i>Due to the Covid-19 Pandemic</i> by Roku, Inc.. (Attachments: # 1 Proposed Order re: motion for continuance, # 2 Exhibit Ex. 1 - Virginia Order, # 3 Exhibit Ex. 2 - Maryland Order, # 4 Exhibit Ex. 3 - California Order)(Mandrusiak, Lisa) (Entered: 04/02/2020)
04/08/2020		Text Order DENYING 170 Motion to Continue entered by Judge Alan D Albright. Before the Court is Roku's motion to continue the trial. Because trial is still several weeks away, it is premature to continue the case at this time. Accordingly, the Court DENIES the motion. (This is a text-only entry generated by the court. There is no document associated with this entry.) (jy) (Entered: 04/08/2020)
05/13/2020	271	Minute Entry for proceedings held before Judge Alan D Albright: Case called for telephonic status conference. Court explained trial was continued to June 29 and that the date was unavoidable. The Court plans to have Mon - Wednesday and then the next week have Mon -Thursday. The Court was asked about when the jury should be selected. The Court feels that maybe the jury will be chosen the Thursday or Friday before. Judge plans to have 8 people on the jury. The Defendant has a conflict with one expert witness who is to be expert in EDTX trial from 7/6 - 7/10. The Court says trial must go when set - we will have to work around conflicts. The Court states that at the Pretrial conference the amount of time limits will be discussed. The Court asks the parties to confer and discuss with the law clerk about the final pretrial conference. (Minute entry documents are not available electronically.). (Court Reporter Kristie Davis.)(am) (Entered: 05/13/2020)
10/05/2020	350	Minute Entry for proceedings held before Judge Alan D Albright: Jury Trial begun on 10/5/2020. TRIAL BEGINS 9:12, OPENING STATEMENTS OF COUNSEL FOR PLA/DEFT HEARD EVIDENCE PRESENTED ON BEHALF OF PLA - Exhibits 1, 2, 24, 40, 108, 129, 204, 206, 237, 274, 316 Admitted Demonstratives: (not admitted) 81 and 82, TRIAL CONT./RECESSED TO: 10/6 at 9:00 a.m. (Minute entry documents are not available electronically.). (Court Reporter Kristie Davis.)(lad) (Entered: 10/06/2020)

Exhibit Y

FILED

AUG 18 2020

CLERK, U.S. DISTRICT COURT
WESTERN DISTRICT OF TEXAS
BY 
DEPUTY CLERK

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

IN RE:
WACO DIVISION
TRIALS

§
§
§
§
§

DIVISIONAL STANDING ORDER REGARDING TRIALS IN WACO

The Waco Division, in accordance with the Western District of Texas's Seventh Supplemental Order Regarding Court Operations Under the Exigent Circumstances Created by the COVID-19 Pandemic, enters the following order finding this Division may safely conduct trials:

1. The Waco Division serves Bell, Bosque, Coryell, Falls, Freestone, Hamilton, Hill, Leon, Limestone, McLennan, Milam, Robertson, and Somervell counties.
2. Since the beginning of July 2020, the county in which the Waco Division sits and those from which it pulls jurors have seen a meaningful decline in new reported COVID-19 cases. For example, McLennan County—one of the densest and most populated in the Division—has seen a 70% drop in rolling 7-day average of daily positives. *See* <https://covidwaco.com/county/>.
3. According to the Center for Disease Control as of the date of this order, the Waco Division's counties have approximately just 2.3% of all cases in Texas. *See* <https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/county-map.html>. Indeed, the Waco Division counties collectively have fewer cases than do a single county in Austin (Travis County), San Antonio (Bexar County), and El Paso (El Paso County). *Id.*
4. The Division has undertaken great efforts to ensure trials can be conducted safely. Among other things, the Court is prepared to mandate appropriate distancing in the courtroom and around the courthouse, limit the number of individuals in the courtroom, provide masks to jurors, supply hand sanitizer, and install plexiglass shields where beneficial and appropriate.
5. The Division has also sought feedback from other judges and lawyers who have conducted in-person trials since the outbreak of the pandemic. That feedback has informed the Division's procedures for trials.
6. Therefore, the Division is confident that, as things stand today, it can conduct fair trials in a safe manner. Accordingly, bench and jury trials in the Waco Division will resume as early as September 1, 2020.
7. The Chief Judge was notified of this Order on August 18, 2020.

It is further **ORDERED**, effective August 19, 2020, at 12:01 a.m., for the protection of court staff, litigants, attorneys, and observers, the following persons shall not enter the Waco Division Courthouse absent a specific order from the Court:

1. Any person who has traveled to any of the following countries within the preceding 14 days: People's Republic of China, South Korea, Japan, Iran, Brazil, or Western Europe;
2. Any person who has resided with, or has had close contact with, someone who has traveled to one of the countries listed above within the preceding 14 days;
3. Any person who is currently under the direction of a licensed healthcare professional or public health agency to self-quarantine;
4. Any person who has been diagnosed by a licensed healthcare provider as having COVID-19 or has tested positive for COVID-19 by a source authorized by any State, and who has not obtained written verification from a licensed medical doctor, doctor of osteopathy, hospital, or public health agency professional that he or she is currently not contagious;
5. Any person who lives with, or cares for, a person described in category 3 or 4 above; or
6. Any person who presents currently having a fever, chills, persistent cough, shortness of breath, persistent pain or pressure in the chest, nausea, or loss of the sense of taste or smell.

It is further **ORDERED** that any person seeking entry to the Waco Division Courthouse at any time may be asked by a Court Security Officer (CSO) or a member of the court staff to confirm that none of the exclusions listed above applies to that person.

It is further **ORDERED** that each person, except a witness while testifying, and an attorney while examining a witness or making a statement to a jury, must wear an appropriate face mask or covering while inside the Waco Division Courthouse, unless excused from this requirement by a judge, CSO, or a member of the court staff. Witnesses shall testify unmasked, and attorneys may speak unmasked, while maintaining social distance. Persons other than jurors must supply their own mask or face covering. Each person in the courthouse must follow the instructions of the court staff and CSOs to aid in maintaining distance in the courthouse.

It is further **ORDERED** that all CSOs, following substantive guidance provided by this Order and administrative guidance from the United States Marshal for the Western District of Texas, shall deny entry to anyone attempting to enter, or remain in, the Waco Division Courthouse in violation of these protocols. In the event of any uncertainty as to whether a person should be denied entrance to the courthouse, the CSOs shall immediately contact the U.S. Marshal or the designated Deputy Marshal for a determination, which shall control.

It is finally **ORDERED** that, unless extended by subsequent order, these restrictions shall remain in place until September 30, 2020, at 11:59 p.m., when they shall automatically expire.

SIGNED this 18th day of August, 2020.


ALAN D ALBRIGHT
UNITED STATES DISTRICT JUDGE

Exhibit Z

Caridis, Alyssa

From: Paige Amstutz <pamstutz@scottdoug.com>
Sent: Monday, October 12, 2020 2:16 PM
To: Johnson, Jeffrey
Cc: Roberts, Clement; de Blank, Bas; Caridis, Alyssa
Subject: Civil Action 6:20-cv-881; Sonos v. Google--Request for Extension of Time

Importance: High

Good afternoon:

I was very recently hired to assist Google in connection with the above-referenced case.

It is my understanding that Google was served on September 29, 2020 and, currently, the deadline to answer or otherwise respond to the Complaint is October 20, 2020.

In order for Google to fully assemble its legal team and assess the allegations, I would really appreciate a 45-day extension of time for Google to answer or otherwise respond. As I know you are aware, this is the extension of time that Judge Albright has found to be reasonable.

Please let me know as soon as practicable.

And, if you would like to visit by phone, don't hesitate to let me know and we can pick a good day and time soon.

As always, I look forward to hearing from you.

All my best,

Paige Arnette Amstutz
Scott, Douglass & McConnico, LLP

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